



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

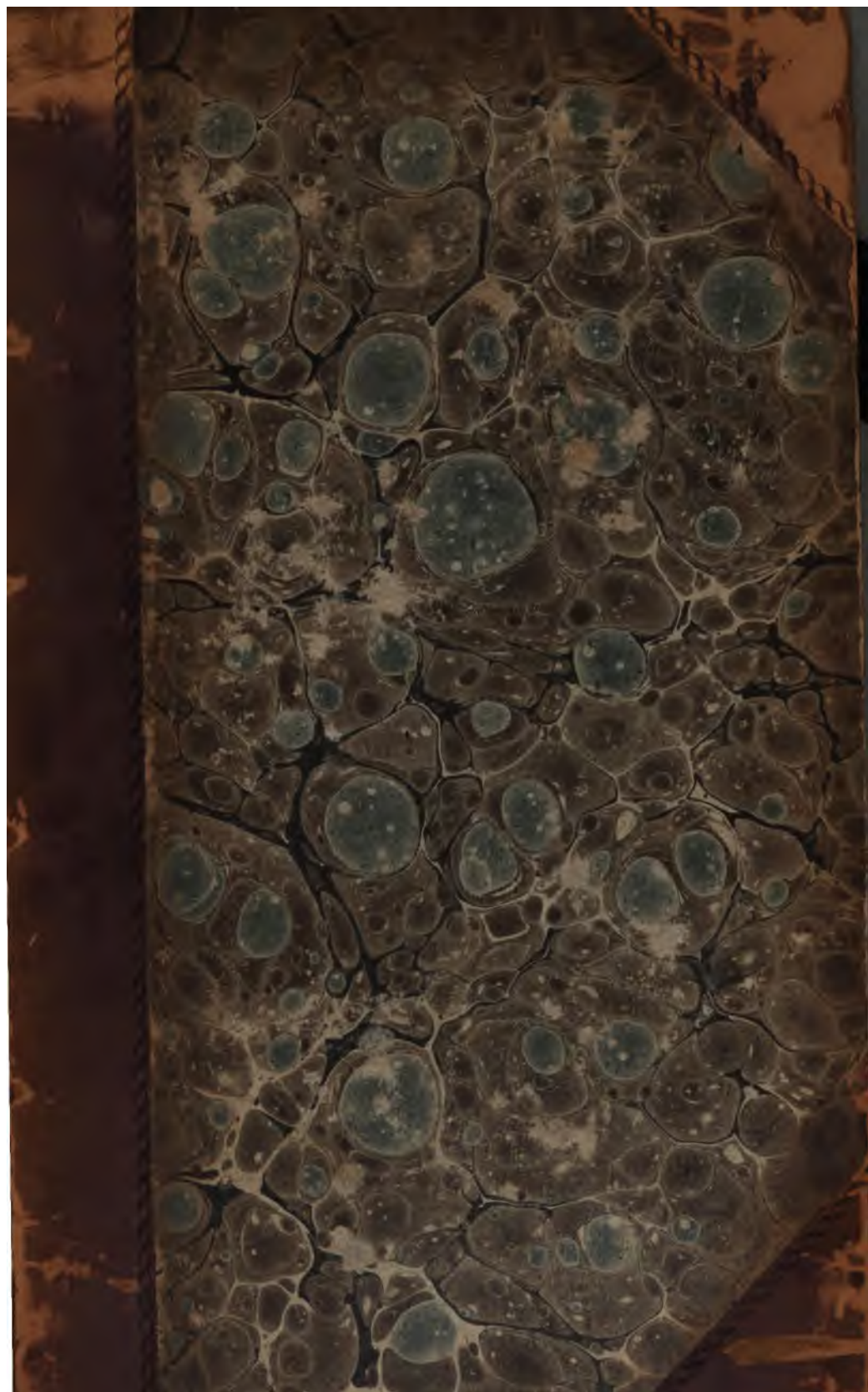
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

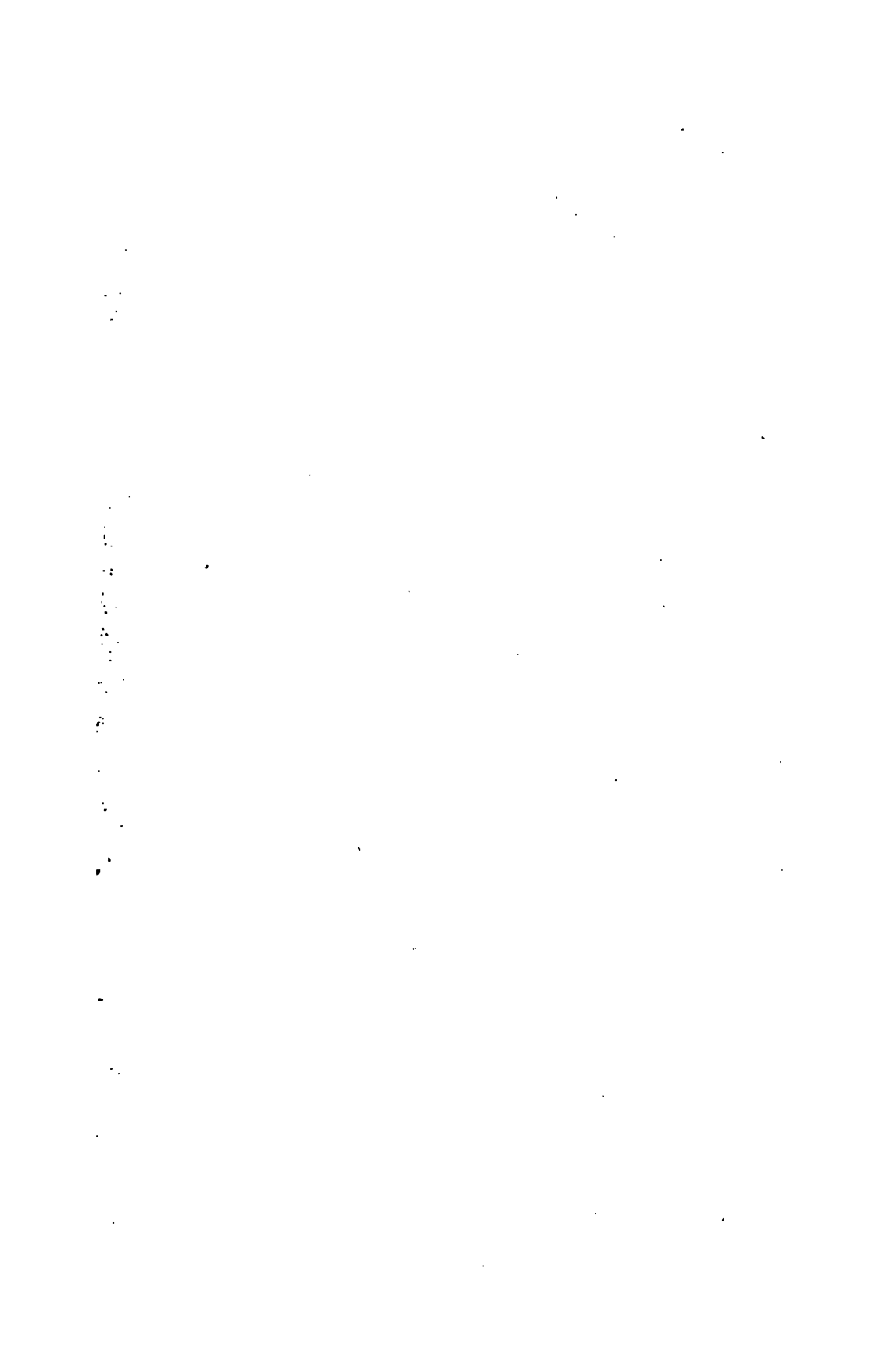




600007598Z

29

607.



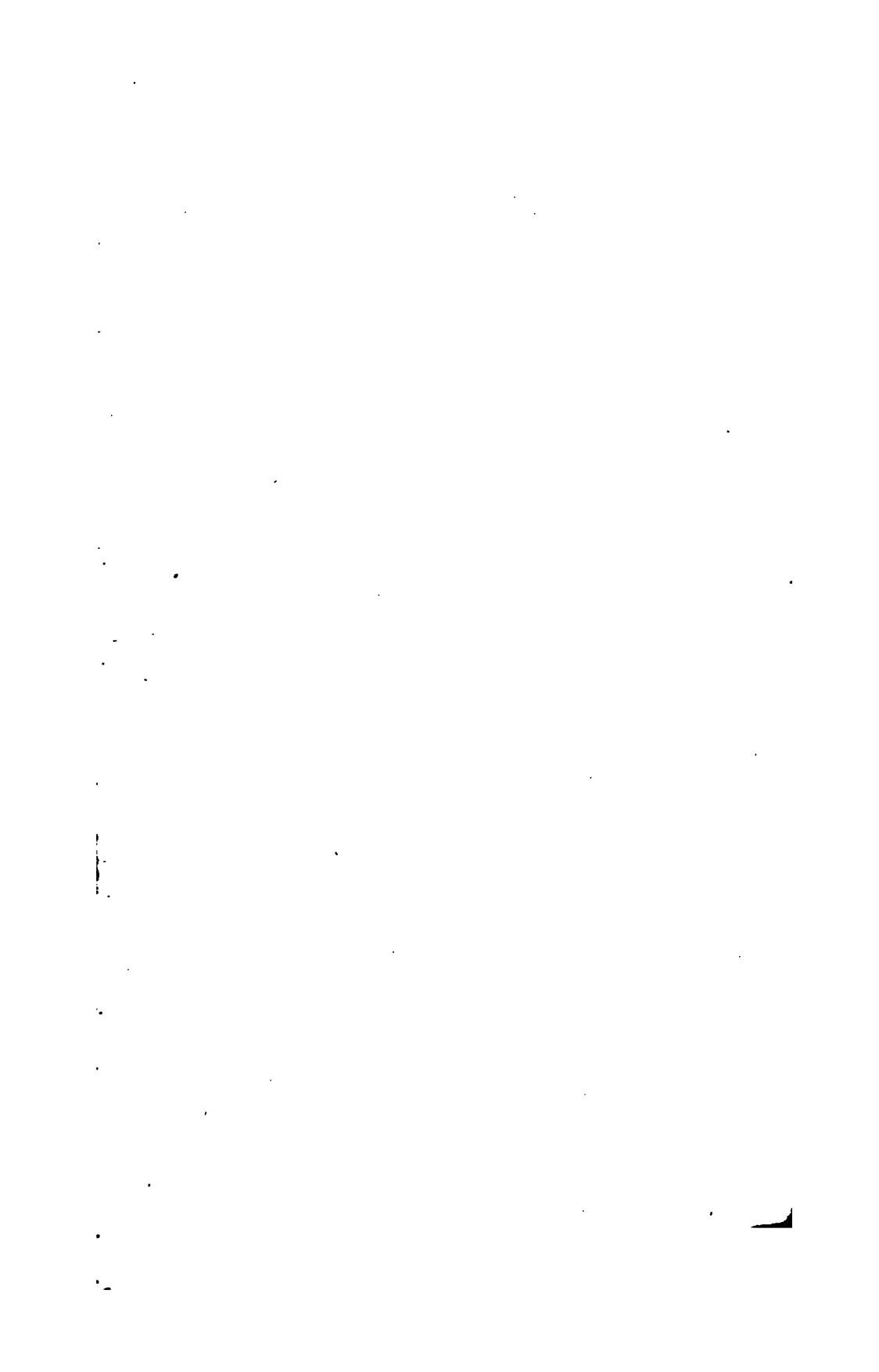


600007598Z

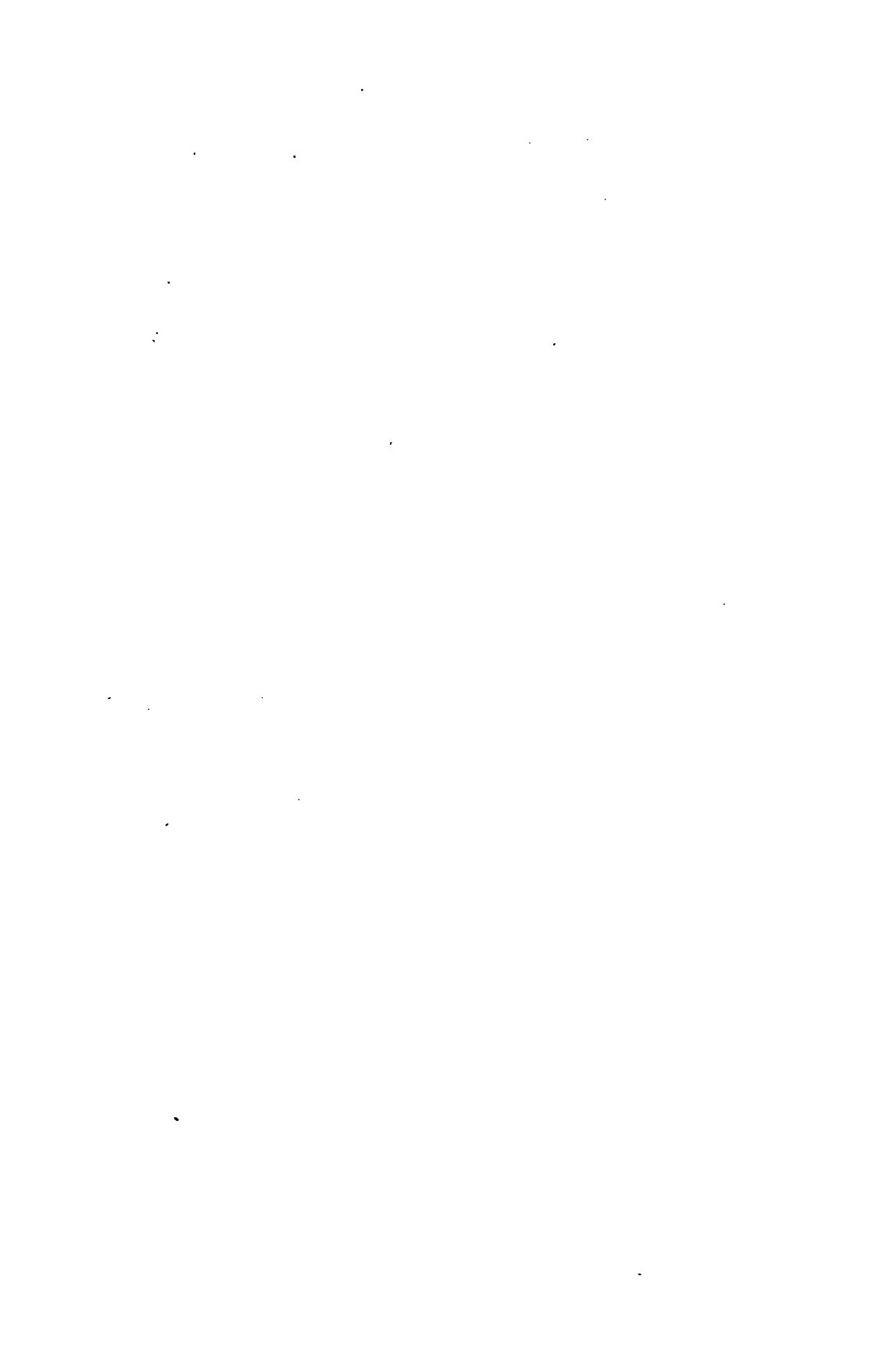
29

607.









SYSTEM
OF
DRAINING, &c.



1
A

7. 1829.

NEW AND EASY SYSTEM
OF
DRAINING AND RECLAIMING
THE BOGS AND MARSHES
OF IRELAND:

WITH PLANS FOR IMPROVING WASTE
LANDS IN GENERAL.

TO WHICH ARE ADDED,
MISCELLANEOUS REPORTS OF RECENT SURVEYS
OF WOODS AND PLANTATIONS:

ALSO

AN EQUITABLE METHOD OF VALUING WOODS, PLANTATIONS, AND
TIMBER TREES OF ALL AGES, WHEN SOLD WITH ESTATES.



By ROBERT MONTEATH,

FORESTER TO HIS MAJESTY, DESIGNER AND VALUATOR OF WOODS
AND PLANTATIONS, AUTHOR OF THE FORESTER'S GUIDE, AND OTHER
WORKS ON PLANTING AND REARING WOODS, &c.

WILLIAM BLACKWOOD, EDINBURGH: AND
T. CADELL, STRAND, LONDON.

M.DCCC.XXIX.

607.

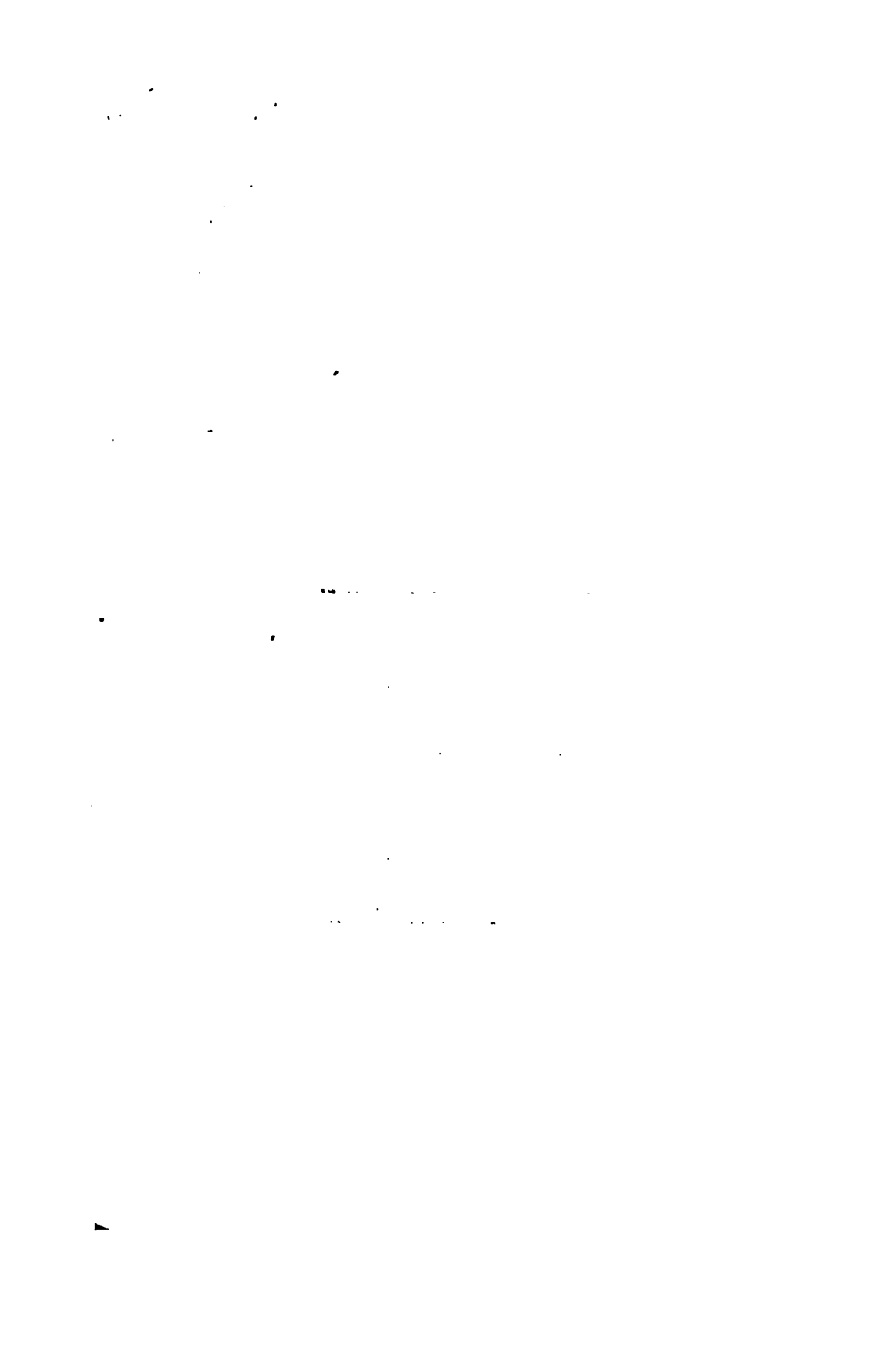


EDINBURGH: PRINTED BY A BALFOUR AND CO. HIGH STREET.

TO
HIS EXCELLENCY
THE DUKE OF NORTHUMBERLAND,
LORD LIEUTENANT OF IRELAND,
&c. &c. &c.
THE MUNIFICENT AND ENLIGHTENED PATRON
OF AGRICULTURE AND SCIENCE ;
THE FOLLOWING PRACTICAL TREATISE IS,
BY PERMISSION,
MOST RESPECTFULLY DEDICATED BY HIS
EXCELLENCY'S MOST FAITHFUL
AND VERY HUMBLE SERVANT,
ROBERT MONTEATH.

Edinburgh, 10th June 1829.





P R E F A C E.

THE Author of this volume, actuated by the strongest feelings and concern for his country's prosperity, and emboldened by the high patronage and approbation bestowed by the principal landholders in the united kingdom of Great Britain and Ireland, on the First and Second Editions of his "Forester's Guide;" begs leave to lay before a discerning public the additional increase of his knowledge and experience in his profession. He makes no pretension to fine, or even correct writing, nor any claim to a classical or literary education which would have enabled him to arrange his ideas more correctly, and present them in a dress which would ensure respect. But with these disadvantages he ventures to present this volume to the world, and fondly hopes,

that many profitable pearls may be gathered from his rubbish. The incontrovertible facts here advanced, are not deductions from his own or any man's theory; but the pure result of many years practical experience. Since the publication of the Forester's Guide, &c. &c., he has had the honour to be extensively employed on many estates, both in Great Britain and Ireland. And he flatters himself, that he has collected a very great additional stock of knowledge in his profession, and enriched his repository with such a valuable collection of facts, that their publicity, through the medium of this Miscellany, cannot fail of being highly interesting and useful to landed gentlemen. These will illustrate to a certainty, not only the very great advantages arising from a judicious system of planting and rearing Woods, Plantations, and Timber Trees; but also the surest and speediest methods of obtaining this object in all kinds of soil. In this volume, the attentive reader will find the description of Plantations corresponding to every soil, and in every stage of the plant, from the Nursery to the full grown Timber Tree. It must be observed, that in making a selection of the various Woods, Plantations, &c. to answer the purposes intended, it was impossible to avoid repetitions. Still, they will be found to differ from each other in some particular or other, and to apply to some Wood, Plantation, or Timber Tree, on every estate; by care-

fully comparing localities much knowledge and useful instruction will be gained. It has been argued, that this will injure his own employment, as well as that of others in the Forestry. This he grants will be the case to a very considerable degree ; but in this he rejoices. He is not seeking solely his own gain, or the gain of any of his profession. He seeks the beauty, the prosperity and the utility of his native soil. He seeks the encouragement of industry, and the employment of the many suffering poor labourers in the country. He wishes to see every inch of useless land brought to advantage, and he will rejoice in seeing a noble profit brought to the treasury, and to the families of those public spirited gentlemen, who, as cultivators of unprofitable and unsightly lands, deserve well of their country, and shall ever hold the highest place in the estimation of the Author.

My desire as an Author is to be useful, and by giving this volume to the public, my end I hope will more likely be gained, as it will extend far beyond the sphere which I or any individual could reach. It may be said that many of the Plantations here treated of, are of a local nature, and only concern individual property. This is in many instances the case ; but in all cases where names are mentioned, it is only with a view to prove beyond dispute, the truth of the thing asserted, that he may say " go there and see." And I most sincere-

ly hope, that such references will give no offence, as they are only used to verify the thing spoken of. Besides, I have the satisfaction of stating, that I have had the consent of the most of those noblemen and gentlemen whose names or places are here mentioned; and I have endeavoured in all cases to avoid the names of places, &c. where I supposed the slightest offence would have been given by inserting them.

It will be seen that the leading object of this publication is, in the first place, the improving of waste lands by a judicious system of planting and rearing Plantations; in the second place, by improving the pastures; and in the third place, by draining the bogs, &c., and I hope it will be found in the sequel that I have clearly made out the utility and immense profits arising from such systems of improvement. This is beyond fair contradiction, and well deserves the pen of the most distinguished talent. In this volume I have added several new schemes of improving waste lands, the utility of which I hope will be justly appreciated. As my Letter to Mr. Secretary Peel is so much connected with the subject, I hope its insertion will not be deemed intrusive by any of my readers; being fully of opinion, that the existence of so much waste land is a great disgrace to any kingdom, particularly to such a wealthy, public spirited, and flourishing kingdom as Great Britain; I most sincerely

wish to see a fund raised for its improvement, and were I to sketch a plan for this end, I could not produce one of more certain and beneficial effects, than that of planting, and otherwise improving its unprofitable wastes. If a subject so very obscure as the Author, might, with the profoundest respect, drop a hint to his most illustrious Sovereign, he would think the improvement of the uncultivated crown lands an object highly worthy of His Majesty's royal attention. In the crown lands at Stirling there are three acres of waste or unproductive land to one of every improved acre. These wastes do not bring ten shillings per acre in their present neglected state. Now, the whole of this land would carry oak, or any kind of timber trees to maturity, and from its vicinity to sea carriage, being within one mile of Stirling shore, it would pay in planting, at an average L.8 per acre of annual rent, in place of not paying ten shillings. But this is only a small, and indeed a very small portion of such crown lands, which I could undertake, in the course of a few years, to put into such a state as would fully realize the above estimate. The improvement of waste lands, to whomsoever belonging, is certainly an object highly worthy the attention of the British legislature. There is as much waste land in Britain and Ireland to improve, as in process of time would provide a fund sufficient to pay the national debt, or remain applicable to any

other purpose which the legislature might prefer. This, no person will deny who has attentively considered the subject. We are told a great deal about the necessity of public economy, and I suppose it is this paltry economy that prevents us from hearing and seeing amongst the supplies voted; say "For the improvement of waste lands in Britain and Ireland, L.100,000." In my opinion this boasted economy, which refuses to lay out tens to gain hundreds with certainty, is rather to be considered as a curse than a blessing to the country. Would it, (I respectfully ask,) be a breach of economy were our ministers to direct a vote of that nature every year, for some years, beginning with L.50,000 or L.80,000 in this time of general depression in trade? In this way they could employ the overplus population at home, at an immense profit, instead of sending them out of the country, and that too by an outlay of only the same money, keeping besides the men in readiness for the navy, army, or manufactures, when a demand for them, or a revival in trade should come.

I recollect the time when it was said, that the nation would be lost and ruined for want of population. The cry then was, "So many thousands are taken away during the war, what will become of the country? Britain will be ruined for want of population, &c." Now, all the cry is, "Britain will be ruined by an over-population." I will ven-

ture to hazard the remark, that the more money government lays out in employing the operatives at home, the more rich will the government become, and the country the more thriving. The unemployed operatives can be carried with much less expense to the Highlands of Scotland, or to the unimproved lands of England and Ireland, and set down there with so much land to improve, than to set them down in Canada. For a stubborn proof of this, look to the Island of Islay. See what has been done by the worthy proprietor, Walter F. Campbell, Esq. of Islay and Shawfield, M. P. and his brother Captain Campbell. They some years ago encouraged a colony of operative weavers from Glasgow,—allotted a piece of uncultivated waste land to each of them. Now they present you with a beautiful clean thriving village. The rough parts of nature are turned into fertile gardens and pasture fields. Here too you will see what judicious management can effect in planting wastes. You are delighted with extensive and thriving plantations, where wood was never known to grow before. My opinion is, that the greater the population of any country is, if industrious, the more rich, strong, and independent will it become. I should like to know who most deserves a statue,—the man who improves waste lands, beautifies and enriches the country by employing and encouraging an industrious population; or the man who conquers and lays waste kingdoms.

In my introduction to the survey of plantations as in pages 43, 44, 45, and 46, it will be seen that I recommend the propriety and great advantage of having the woods, &c., on every estate surveyed, and plans for their future improvement laid down, and if these be minutely entered into, as I trust is the case with the different plantations mentioned, it will be found to give universal satisfaction. I hope also that the hint to Land-surveyors to do likewise in their professional capacity will not be altogether thrown away.

CONTENTS.

	Page
LETTER TO THE RIGHT HONOURABLE ROBERT PEEL, ON THE MEANS	
OF EMPLOYING THE OPERATIVES OF GREAT BRITAIN AND IRELAND,	1
Review of Mr. Secretary Peel's Letter,	6
Queries from J. F. Burke, Esq. Greenwich, on establishing a forest,	18
Survey of Mackroy Farms, Argyleshire,—immense profits from annual cuttings of Oak Coppice, in a Letter to W. M'Kinnon, Esq. Greenock,	19
ON THE MEANS OF ASCERTAINING THE COMPARATIVE TANNING POWERS	
OF ALL KINDS OF BARKS,	21
GRATIS CIRCULAR ON YOUNG PLANTATIONS, WITH THEIR MEANS OF	
PRESERVATION IN 1826, AN UNPRECEDENTED DROUGHT,	32
Laying, an excellent method in very dry seasons,	34
WINNOWING MACHINE FOR DRYING CROP IN WET HARVESTS,	37
INTRODUCTION TO THE REPORT OF PLANTATIONS SURVEYED IN IRE-	
LAND IN 1826,	41
Deficiency of Agricultural improvements, and the great good that may be done by improving the waste lands in Ireland, by a ju- dicious system,	42
Immense advantages by having Plantations on every Estate Sur- veyed, and a System of Improving them in future laid down,	43
No. 1. Report of Plantations near the Approach Gate to Powers-	
court Mansion,	48
2. Clump opposite the Gate,	50
3. Plantation within the Gate leading to the Mansion,	51
4. Plantation.—Beech Grove on both sides of the Approach to the Mansion,	52
Plan for thinning old trees, and preserving a crop on the ground,	ib.
Best method to pollard trees in such places,	55
5. LARGE TREES ALONG A PRIVATE FAMILY WALK,	56
Great disgrace to destroy or cut down old ornamental trees,	57
Apropos lines of the Poet,	58
Different management of young trees for ornament,	59
Regret of a Proprietor when too late,	ib.

	Page
No. 6. Silver Dale,—Beauties of old trees covered with ivy,	60
7. A Young Plantation to be reared up for standing trees,	61
8. Field Trees,	62
9. Large trees of Plane, Ash, and Elm growing natural from the old stool in detached parks,	63
Two common Willows or Saugh trees of extraordinary growth,—great profits from rearing such trees,—Dun- troon Castle,	64
10. Island Mackaskan, the property of Neill Malcolm, Esq. surrounded by the sea,	65
Wonderful growth of trees on such exposure,	ib.
11. A neglected Coppice Wood,	66
Example of good results of thinning neglected Coppice Woods,	68
12. Rearing up unenclosed Natural Stools,	69
Example of immense profits from rearing up natural shoots for standing timber trees, with the cheapest method of enclosing such, in particular lands,	70
The propriety and advantage of rearing vast quantities of trees for the Navy from all such natural stools,	72
Supineness of Proprietors in not attending to their own interest in rearing trees of this description both as em- bellishments and value to their properties,	ib.
13. From the late Lord Meadowbank's Instructions to Fores- ters, corresponding with the Author's ideas,	73
Statute of Henry VIII. as to leaving standards amongst Coppice,	78
Copy of Acts of Parliament regarding the destroying of trees,	ib.
14. Great Chesnut Tree on Mount Etna,	81
Fine Spanish Chesnut Trees at Inverary Castle,	82
15. Beautiful Old Scotch Firs on the Artificial Knoll, called Alexander M'Donald's Camp,	83
16. Explanation of the Plates,	85
17. Great utility of Roads or Rides through Woods,	87
18. Forester at no loss to discover a Proper Method of Im- provement,	89
Miserable state of a neglected Wood, with means for its recovery,	90
19. Trees in Fields or Single Rows,	92
20. Injury of Growth of Trees by Sheep or Cattle getting in,	93
21. Advantage of draining Woods and Woodlands,	ib.
22. A Glen,—Plant Willow where damp and cannot be drained,	94

CONTENTS.

xvii

	Page
Great destruction by over-pruning young healthy Trees, —a most ruinous system,	95
The planting and rearing of Trees of greater importance than even Proprietors themselves are apt to imagine,	99
Office of a Forester on an Estate, of the very greatest re- sponsibility,	ib.
Only men of ability should be intrusted with manage- ment and rearing of Woods,	ib.
Forester working for the interest of his master's posteri- ty, for his King and country,	ib.
Great deliberation necessary before beginning to prune and thin a Plantation,	99
No. 23. Field and Rows of Trees should stand for shelter, &c.	100
24. Propriety of thinning Groves of Trees,	101
25. Pasture Land,	102
26. Meadow,—ruinous system of injudicious thinning,	103
27. Belvidere, on the Estate of Balgone, Haddingtonshire,	104
Craigmuir young Planting, ditto,	108
New Scheme of covering unsightly ground by Trans- planting,	110
Plantation to be made in a Valley, Balgone,	111
Beautiful Romantic Scenery here equal to the High- lands,	ib.
28. Round Stable Padock at Powerscourt,	113
Value of the Ash Tree,	114
29. Racecourse Field,	115
30. Misfortune of cutting old Trees out near a Mansion,	117
31. Destroying Trees, by cutting large branches off,	ib.
32. Trees about a Garden,	118
33. Cultivate Spanish Chesnut Trees for ornament,	119
34. Exposed Bank,	120
35. Bank of Trees near Powerscourt House,	ib.
Great natural curiosity of these Trees,	121
36. Field Trees, when thinned, the roots should all be grub- bed out,	ib.
37. Meadow much in want of thinning,	122
38. A Bank,—keep up Evergreens,	123
39. Bank of young Planting,—cut out all unthrifty Trees, and drain,	ib.
Plant a triangular row of Spruce Firs, for shelter, &c.	124
40. Young Planting,	125
41. Young Plantation,—Larch Fir not suitable for the soil,	126
Planting on a very bare cold bleak exposed soil,	ib.
Method of treatment on such situations,	128

	Page
No. 6. Silver Dale,—Beauties of old trees covered with ivy,	60
7. A Young Plantation to be reared up for standing trees,	61
8. Field Trees,	62
9. Large trees of Plane, Ash, and Elm growing natural from the old stool in detached parks,	63
Two common Willows or Saugh trees of extraordinary growth,—great profits from rearing such trees,—Dunroon Castle,	64
10. Island Mackaskan, the property of Neill Malcolm, Esq. surrounded by the sea,	65
Wonderful growth of trees on such exposure,	ib.
11. A neglected Coppice Wood,	66
Example of good results of thinning neglected Coppice Woods,	68
12. Rearing up unenclosed Natural Stools,	69
Example of immense profits from rearing up natural shoots for standing timber trees, with the cheapest method of enclosing such, in particular lands,	70
The propriety and advantage of rearing vast quantities of trees for the Navy from all such natural stools,	72
Supineness of Proprietors in not attending to their own interest in rearing trees of this description both as embellishments and value to their properties,	ib.
13. From the late Lord Meadowbank's Instructions to Foresters, corresponding with the Author's ideas,	73
Statute of Henry VIII. as to leaving standards amongst Coppice,	78
Copy of Acts of Parliament regarding the destroying of trees,	ib.
14. Great Chesnut Tree on Mount Etna,	81
Fine Spanish Chesnut Trees at Inverary Castle,	82
15. Beautiful Old Scotch Firs on the Artificial Knoll, called Alexander McDonald's Camp,	83
16. Explanation of the Plates,	85
17. Great utility of Roads or Rides through Woods,	87
18. Forester at no loss to discover a Proper Method of Improvement,	89
Miserable state of a neglected Wood, with means for its recovery,	90
19. Trees in Fields or Single Rows,	92
20. Injury of Growth of Trees by Sheep or Cattle getting in,	93
21. Advantage of draining Woods and Woodlands,	ib.
22. A Glen,—Plant Willow where damp and cannot be drained,	94

CONTENTS.

xvii.

	Page
Great destruction by over-pruning young healthy Trees, —a most ruinous system,	95
The planting and rearing of Trees of greater importance than even Proprietors themselves are apt to imagine,	99
Office of a Forester on an Estate, of the very greatest re- sponsibility,	ib.
Only men of ability should be intrusted with manage- ment and rearing of Woods,	ib.
Forester working for the interest of his master's posteri- ty, for his King and country,	ib.
Great deliberation necessary before beginning to prune and thin a Plantation,	99
No. 23. Field and Rows of Trees should stand for shelter, &c.	100
24. Propriety of thinning Groves of Trees,	101
25. Pasture Land,	102
26. Meadow,—ruinous system of injudicious thinning,	103
27. Belvidere, on the Estate of Balgone, Haddingtonshire,	104
Craigmuir young Planting, ditto,	108
New Scheme of covering unsightly ground by Trans- planting,	110
Plantation to be made in a Valley, Balgone,	111
Beautiful Romantic Scenery here equal to the High- lands,	ib.
28. Round Stable Padock at Powerscourt,	113
Value of the Ash Tree,	114
29. Racecourse Field,	115
30. Misfortune of cutting old Trees out near a Mansion,	117
31. Destroying Trees, by cutting large branches off,	ib.
32. Trees about a Garden,	118
33. Cultivate Spanish Chesnut Trees for ornament,	119
34. Exposed Bank,	120
35. Bank of Trees near Powerscourt House,	ib.
Great natural curiosity of these Trees,	121
36. Field Trees, when thinned, the roots should all be grub- bed out,	ib.
37. Meadow much in want of thinning,	122
38. A Bank,—keep up Evergreens,	123
39. Bank of young Planting,—cut out all unthrifty Trees, and drain,	ib.
Plant a triangular row of Spruce Firs, for shelter, &c.	124
40. Young Planting,	125
41. Young Plantation,—Larch Fir not suitable for the soil,	126
Planting on a very bare cold bleak exposed soil,	ib.
Method of treatment on such situations,	128

	Page
No. 42. Powerscourt Wood or Deer Park,	129
Impropriety of careless planting,	130
Cheap method of enclosing Trees or Plants,	ib.
Expense of planting by such a system,	131
Great advantages of transplanting Trees, and making Pol- lards,	132
43. Wood or Deer Park, north side,	133
44. Powerscourt Glen Wood,	135
Oak Coppice will pay L.20 per acre of yearly rent, if at- tended to in all such situations,	136
Trees in all such situations should always be converted into the most profitable systems,	ib.
45. Coppice Wood,—same Glen,	137
46. Leackenderry Hill, in Ireland,	138
Immense profits from Natural Wood,	139
47. Dargle Glen, Powerscourt, Ireland,	ib.
Method of thinning, to keep a crop on the ground,	ib.
48. GREAT PROPRIETY OF ESTABLISHING A NURSERY ON ALL ESTATES,	142
49. Improving pasture Lands,	143
Want of clothing a great grievance to the operatives of Ireland,	ib.
A remedy for this grievance,	144
Example from the Scotch Highlanders,	ib.
DRAINING AND IMPROVING THE BOGS AND MARSHES OF IRELAND,	149
Draining these Marshes within themselves where it is impossible to get a free level, without a prohibitory expense,	151
Expense, method of cropping, manuring and Rental,	154
Manuring and keeping in a productive state all such Lands,	157
Expense of this System of draining, realized in three years with a profit,	160
By draining the Bogs for cropping, by improving the pasture Land and planting the waste Lands of Ireland, will be the best Poor Laws, and the best Emigration Laws that could be introduced into Ireland,	162
No. 50. Planting exceedingly bare lands in Berwickshire,	164
51. Wood Park, Linlithgowshire,	166
52. Stripes and Belts in a very bleak part of the country,	169
53. Some kind of Stripes in another part of the country,	170
A proper system of improving all such,	172
54. A young Plantation,	174
55. Old Coppice,	176
56. Trees in approach to the House,	177

CONTENTS.

xix

	Page
No. 57. Treatment of a young Plantation,	179
58. Ditto Stripe,	180
59. Home Plantation near the Mansion,	181
60. General Remarks on the Plantations from No. 55,	183
61. Treatment of old Fir Wood,	186
62. Stripe of planting on a road side,	189
63. Treatment of a young Plantation,	190
64. Old Plantation exposed to the Western Ocean,	191
65. Culnashennaig Farm, Argyleshire,	195
66. Barnegaul and Gloster Farms, Kintarbert Estate, Argyle- shire,	198
67. A North and West Belt,	199
68. Farm on Dumfries Estate, Ayrshire,	201
69. Young Planting, Dumfries Estate, Ayrshire,	202
70. Fir Plantation, Ross-shire,	203
Letter on the weight and tanning principles of the Turkey Oak Bark,	207
Fine Spanish Chesnut Tree at Riccarton, an incontrovertible proof of the layering system,	209
Spanish Chesnut Tree at Preston Grange,	211
Proof of layering by a prolific Spruce Fir Tree on the estate of Braco, Perthshire,	212
Danhail Moss, as referred to in the draining system,	215
Narrow stripes of planting,	217
Belts and stripes of planting made profitable as well as ornamental, ib.	
Planting a very critical spot on the estate of Whitehall, Berwick- shire,	220
AN EQUITABLE METHOD OF VALUING WOODS, PLANTATIONS AND TIMBER TREES WHEN TO BE SOLD WITH ESTATES,	223

EXPLANATION OF PLATES.

	Page
Plate I. The great Chesnut Tree on Mount Etna, see No. 14, page 81,	85
Plate II. Figure 1, To represent a Pollard,	ib.
——— Figure 2, To represent the converting growths of Natu- ral Stools into timber trees,	86
——— Figure 3, A Coppice Stool properly cut and thinned in time,	ib.
——— Figure 4, A Coppice Stool of Oak cut and dressed in the old system,	ib.
——— Figure 5, Something of the same kind,	ib.
——— Figure 6, A representation of an unprotected tree,	ib.
Plate III. Spanish Chesnut at Riccarton—To face title page,	209

 ERRATUM.

Page 235, line 11 from bottom, *for* tenant *read* proprietor

LETTER

TO

THE RIGHT HON. ROBERT PEEL,

SECRETARY OF STATE,

ON THE MEANS OF EMPLOYING THE UNEMPLOYED OPERATIVES OF GREAT BRITAIN AND IRELAND; ALSO OF AFFORDING A SECURE AND IMMENSE RETURN TO GOVERNMENT FOR THE OUTLAY.

SIR,

THERE are of unimproved lands, in Scotland alone, 14,218,224 acres; triple that quantity in Ireland; and nearly as much in England. One half of which, particularly in Scotland and Ireland, can be improved by planting, and will carry trees to maturity; the greater part of such land, particularly in the Highlands of Scotland, and many parts of England and Ireland also, lie contiguous to arms of the sea, which afford facility for exportation at little expense. I could point out thousands of acres of such land that is not paying the proprietors one shilling per acre, and every acre of it will grow excellent timber, with only the expense of enclosing and planting.

Supposing government to become feuars of such lands, say to the amount of 10,000 acres, less or

B

more, in England, Scotland, and Ireland; this would employ, in enclosing and planting in the three kingdoms, upwards of 30,000 people; but supposing that to be done gradually, fewer or more people could be employed as necessity required. That there are thousands of acres in these countries that are capable of being improved in this way no one will deny; and the improving of these lands in our own country, in the first place, is of far more national importance than to improve waste lands in a foreign country, and at a great expense to protect; for, by improving by planting the waste lands at home, it will not only beautify, shelter, and enrich the whole country, but will secure to government in a short time an ample supply of oak timber for the navy, at one shilling per foot, in place of paying five shillings and six shillings for it as at present, and from a foreign country; and besides, were the foreign supply cut off by a war, there is not full grown timber in this country to supply the demand for two years. That the profits would be immense to government by such a system of planting, &c. the following will show, of which I am ready to give proof, were it necessary: The lands I refer to could be feued at from six to ten shillings per acre.

Supposing 100 acres to be planted and reared solely for profit, four feet plant from plant, the expense of enclosing and planting, (taking into consideration the inexperience of the workmen employed,) allow one shilling and eightpence per day each man, will cost L.10 per acre; although I am aware it can be done for much less.

At this rate 100 acres will cost.....	L.1000	0	0
Rent of 100 acres at 10/ per acre annually, is L.50, which extended for 20 years, makes	1000	0	0
Interest on the outlay at 5 per cent. for 20 years.....	1000	0	0
Supposing interest on the rent for 20 years.....	200	0	0
To superintending and expense in the rearing for 20 years.....	1000	0	0
<hr/>			
Total outlay for 20 years.....	L.4200	0	0
The thinnings at 10 and 15 years will be at least, after reducing the number of trees to 1000 on each acre.....	L.500	0	0
Trees left, only supposing them 2/ per tree, wood and bark, which will be rather under the true value.....	10,000	0	0
<hr/>			
	10500	0	0
<hr/>			
Total profit of 100 acres in 20 years.....	L.6300	0	0

Again, supposing the whole to be *cut over* at the end of 20 years, being oak, it grows up without any expense, and will pay regularly every 20 years after, a much larger sum ; but should it be reared up to the age of 50, or to 100 years, to maturity for naval timber, &c. it will pay much better, and the crop equally secure. It is a well authenticated fact, that woods, judiciously planted and reared, will pay an annual rental of from L.6 to L.10 per acre. Having been in most of the sea-port towns in Ireland lately, I learned from good authority, that the annual importation of foreign oak bark into that country amounts to 10,000 tons, as much

into Scotland, and I should suppose twice that quantity into England. Now, supposing that no more than was necessary for home consumption was reared yearly in these kingdoms, it would yield, at the average prices of oak bark for some years back, the sum of L.400,000 sterling, and its manufacture would employ, from April to September, 20,000 labourers at least, and 5,000 constantly; the profits of this alone divided amongst 100 landed proprietors in each of the three kingdoms would employ a vast number of people; and supposing their wood lands divided into 20 cuttings, and cut annually, would give them a very handsome yearly return.

I am aware that many proprietors of this kind of land have not the means of the first outlay at their command; but if government do it, to a larger or smaller extent than that first proposed, and carry the produce as timber trees to maturity, the profits would be beyond what I have already stated. Even were a joint-stock company to embark in this plan, I should suppose it worthy the British government to be at the head of it; the king, the prince, the noblemen, the gentlemen, every landed proprietor, and every lover of his country, to be members thereof. By giving the proprietor, whose land is taken or feued, an interest in the concern, by allowing the rents to lie over for 20 or more years, he would then become a considerable owner, and would have, by this means, a particular interest in seeing it properly managed. That all kinds of timber equal, and many kinds superior to foreign timber can be rear-

ed in this country when properly attended to, no one will deny. The more fully to explain all this, I send you a copy of my "Forester's Guide, and Profitable Planter," published in 1824, which, if your time will permit you to glance over the introduction, &c. it will prove what I have here stated. Should these few hints, which I am convinced would do good if put in practice, be of any use to you in the present very trying state of the country, I shall be in readiness, should you require it, to make a statement of the expense that timber can be reared at, from the nursery to the naval shipbuilding yard; also, all kinds of timber for other purposes; and at all times ready to give any farther explanation.

I have the honour to remain,

SIR,

Your most obedient, and very faithful Servant,
ROBERT MONTEATH.

Stirling, 9th September 1826.

P. S.—The sum paid by Great Britain and Ireland for foreign bark is very considerable, as is plain from the above Letter; but is almost nothing when compared with that paid for timber, there being no less than L.1,500,000 sterling paid annually by Britain and Ireland for foreign timber; this immense sum, which is provable from unexceptionable authority, need by no means stagger the belief of any one who for a moment considers the great number of large vessels constantly employed in importing timber. The one-half of that sum would employ annually and regularly all the

unemployed Operatives, and improve all the waste lands of Great Britain and Ireland, and keep them always employed, although the population was even much more numerous, and thus keep the strength of the nation for the day of battle, both as to men and means within herself.—The above Postscript was not in the original Letter.

It may not be uninteresting to our readers to give the following Review of the above Letter, taken from the Edinburgh Star Newspaper, 1826 :

PLANS FOR EMPLOYING THE PEOPLE.

Mr. MONTEATH, author of "The Forester's Guide," and other works on the subject of Planting, has sent us a copy of a Letter, which he has addressed to Mr. Peel, on the means of giving occupation to all the unemployed workmen in Great Britain and Ireland, and of affording at the same time a secure and immense return to government for their outlay. "There are," he states, "of waste unimproved lands in Scotland alone, 14,218,224 acres ; triple that quantity in Ireland ; and nearly as much in England. About one-half of the whole will carry wood, and lie so contiguous to the sea as to afford every facility for its exportation. Now, supposing Government to become feuars of 10,000 acres of these lands, this would employ, in enclosing and planting, upwards of 30,000 people. Any quantity of the lands referred to could be feued at from 6s. to 10s. per acre—and on 100 acres the cost of the whole process would, therefore, be nearly as follows :

Expense of enclosing, plants, planting, and wages to workmen at 1s. 8d. per day, L.10 per acre,—or	L.1000
Rent for 20 years, at most - - - -	1000
Interest on the outlay for 20 years - -	1000
Interest on the rent for 20 years - -	200
To superintending the rearing for 20 years -	1000

The total outlay for 20 years, would, therefore, amount at the utmost to only L.4200 ; while the thinnings at 10 and 15 years, would, after reducing the trees to 1000 on each acre, bring at least L.500 —and the trees left, only valuing them at 2s. each, wood and bark, at the end of the experiment, L.10,000 more. The total profits on the 100 acres, in 20 years, would thus amount to L.6,300. “ Supposing the whole,” proceeds Mr. Monteath, “ to be cut over at the end of 20 years, being oak, it grows up without any expense of planting, and will pay regularly every 20 years after, a much larger sum ; but, supposing it to be reared up to the age of 50 or 100 years, to maturity for navy timber, &c. it will pay much better, and the crop will be equally secure. It is a well authenticated fact, that woods, judiciously planted and reared, will pay an annual rental of from L.6 to L.10 per acre. Having been in most of the sea-port towns in Ireland lately, I learned from good authority that the annual importation of foreign oak bark into that country, amounts to 10,000 tons ; as much into Scotland, and, I should suppose, twice that quantity into England. Now, supposing that no more than was necessary for home consumption were reared yearly in these kingdoms, it would

yield at the average prices of oak bark for some years past, the sum of L.400,000 sterling, and its manufacture would employ from April to September, 20,000 labourers at least, and 5,000 constantly throughout the whole year."

We do not perceive, for our own parts, that there exists any good or formidable objection to the practicability of this plan, except that which arises from the large outlay that would be required, in the first instance, on the part of Government. This, however, is a difficulty which belongs, at least in an equal degree, to every other method which have been proposed for giving employment to our surplus population. The most magnificent of all the devices that have been suggested for this purpose, that of Colonization, cannot be effected without a national expenditure of alarming magnitude. Lord Elgin's *Trenching* system, again, which we noticed a few weeks ago, proceeds in the like manner upon the supposition of a public contribution—the benefit of which, however, are, in that case, to go to the paupers and the landed proprietors of the country exclusively. Last of all, Mr. Lindsay's scheme for recovering land from the sea, and in that way as it were enlarging the territory and augmenting the resources of the kingdom, can, no more than that of any of his brother projectors, be carried into execution without immediate and considerable outlay. The final object contemplated by each of the experiments proposed may be ample and sure remuneration; but all of them begin by a demand upon us for heavy

payments, as the condition upon which alone they promise us their golden profits.

If such a crisis then has really at last overtaken us, that something must be done at the general cost to rid the country of its surplus population, we see not why these plans of Mr. Monteath and Mr. Lindsay should not, at least, receive their share of public patronage as well as others that may have a similar end in view. They both of them possess certain advantages over even that of Emigration, inasmuch as they may probably be put in operation at a considerably smaller expense, while, at the same time, instead of sending our peasantry and artizans abroad, to find a subsistence among strangers, they would retain them, at least, for a time, in the land of their birth, and amid the society of their kinsmen. Why should not the two processes of relief go on together? That which aims at bringing the resources of the country up to the necessities of the population, would only both assist and be assisted by the other, whose object it is to bring down the amount of the population to the capacity of the country. The end of each is, in truth, only to reach in a different way from the other, the same point of right and comfortable adjustment. The one would suit the wishes of those of our countrymen who prefer the home of their fathers to a foreign shore; while the other would form an outlet of escape for those more adventurous spirits, who see, in the unoccupied expanse of a new country the proper sphere for their enterprise and activity to figure in. The effect of the one as well as of the other, would just be, in so

far at least, to lift from off the groaning soil the burthen of its starving population.

One thing is never to be forgotten, in reference to any plan that may be proposed for the employment of the people. It is not, in fact, employment that is wanted for its own sake, but employment as a means of creating subsistence merely. This is the test by which we ought to try the pretensions of every project that may be suggested in reference to this matter. We have already applied the principle in question to Lord Elgin's trenching scheme. If the return arising from that operation will not pay the cost occasioned by it, it were merely to throw away so much of the national funds, or the public charity, to contribute any sum of money for its encouragement. If the effect of expending in that way an additional pound sterling upon every acre, shall merely be to raise an additional ten shillings worth of produce, we should certainly act far more wisely in at once devoting our money to the purchase of double that quantity of produce abroad. We should not in that manner certainly give *employment* to so many of our countrymen, but what is much better, we should give *subsistence* to twice as many of them. Just in a similar way do we estimate the value of these schemes of Mr. Monteath and Mr. Lindsay. It is not because it would set a working so many thousands or tens of thousands of our idle population, that we would have our waste lands planted; but simply because the real value of the work would more than pay the cost of it; and would thus enable us to give to our operatives bread for their mouths, as well as

mere occupation for their hands. And as for the land which Mr. Lindsay proposes to recover from the sea, it is obvious that it will only be a real accession to the resources of the kingdom, if it shall be able to produce a certain quantity of grain for a smaller sum of money than would suffice to procure an equal quantity in any other way. If the scheme do not promise this much at least, it is worth nothing. It could never, of course, be expected that government should devote any part of the public money to so preposterous an enterprize, as that would be, of cultivating land, obtained either in this way or in any other, at a greater expense than the produce promised to repay. Mr. Lindsay, we do not doubt, at least believes himself abundantly able to prove that the plan he has laid before the public does not involve any such absurdity as we are here referring to.

The late Lord Meadowbank, in his interesting publication in 1815, has the following very spirited and judicious remark :—" Were the Highland proprietors to set about establishing a proper cultivation in their vast domains, they would soon be amply rewarded by the rising value of their property ; and would no longer suffer the disgrace of urging emigration, by their short-sighted projects of improvement, that high-spirited and noble race of men, who, by their intrepidity and self-devotement to national glory, have raised their reputation to a level with Spartan fame." I wonder what his Lordship would now have said on the proposed plan of emigration, while there is still such a want

of improving spirit amongst the proprietors of the waste lands of Scotland and Ireland.*

QUERIES AND ANSWERS.

The following Queries were sent me for Replies by J. F. Burke, Esq. Greenwich. It was not till after I had replied to them that I understood their design was to establish a Joint Stock Planting Company. I considered it for the use of private property, and answered them as intended for some large landed proprietor's estate.

QUERY 1.—The plan to be pursued in establishing a general Nursery of Forest Trees for all the soils, with the time and probable expense?

ANSWER.—There are three different soils mentioned in your Letter; but as the climate and si-

* I am of opinion his Lordship would say: Let the British Government improve their waste lands and populate the thousands of miles of almost desolate countries at home in the first place. I recollect the time when passengers and goods were often six or eight days betwixt Greenock and Rothesay, about 20 miles; now the conveyance is four times a day, and not above two hours. By the detention of a Packet, I once paid threepence for the twopenny loaf at Inverary. In these times many places of the Highlands of Scotland were not worth cultivating; but now the conveyance by steam vessels to all parts of the Highlands and Islands of Scotland has greatly altered the case, and immensely advanced the value of property, which by a due attention to cultivation, would employ many thousands of the labouring population, and greatly enrich the proprietors.

tuation may be nearly the same ; two roods, say half an acre, will be sufficient to rear plants of every description for planting 100 acres annually, if once established ; to effect which, select a nursery as near a-kin to the different soils as possible ; to save expense of enclosing, one spot may do for the whole ; which, in the first place must be properly enclosed, not only to keep out cattle and sheep, but game of every kind. For this purpose, a stone fence is the most permanent, safest, and speediest brought to be effectual. If stones could be got in the neighbourhood, a fence of five feet high would be sufficient, and could be done at from 6s. to 7s. 6d. per rood of 18 feet. Next to this, is a hedge, and paling to protect it, as it cannot be a fence without it ; it will cost from 4s. to 6s. per rood ; but requires a little yearly cleaning and keeping. The ground should be trenched over during the summer months, and properly prepared for receiving the seed or seedlings early in spring. I would recommend filling it with seedlings, as being both cheaper and easier managed ; about L.100 will fill it up at first, with a sufficient number of seedlings, and from L.40 to L.50 for seedlings annually, will keep a sufficient quantity of every description for planting out 100 acres yearly. Thus a sufficient number of plants of every description may be obtained for planting 100 acres, at an expense not exceeding 10s. per acre.

QUERY II.—Three different enumerations of the plants most proper for each soil. The expense of planting and fencing in large enclosures. The

probable period and value of the thinnings, and the annual charges of management; this calculation being with a view to ascertain the earliest probable return from the soil?

ANSWER.—On light sandy soils, the larch and the spruce, of the fir tribe, can be reared, and will come to maturity as timber trees. If the sub-soil is of light sand and not very deep, and turning to clay below, the Scotch elm, ash, and plane, of the hard wood tribe, will come to maturity as timber trees; and the oak for coppice, if the soil is once made by the larch firs, as described in my Forester's Guide, will do extremely well when properly managed. On the gravelly clays, &c. the oak, Spanish chesnut, and the Scotch elm (which is next to the oak, and is used for ship-building,) will come to maturity as timber trees. After the nursery is established, the expense of plants and planting each acre with all kinds, will be from 22s. to 30s. The expenses of enclosing will be as in reply to Query First; say from 6s. to 7s. 6d. if with stone; and hedge, &c. from 4s. 6d. to 6s. per rood. If the plantation be in large clusters, the enclosing will be very trifling per acre; if they are detached in small clusters, the expense will be the greater; but the exact expense will be easily ascertained by measuring the line of fence round the different plantations. I have, however, seen some plantations, when of considerable extent, enclosed at the rate of 5s. per acre; there is often a great saving by judiciously laying off the enclosures. The nursery, enclosing the wood-

land, and planting, will require a proper skilful manager to superintend the work, &c. which will cost at least L.60 annually. If a plantation of firs, should the situation be much exposed, they must be planted at distances of four feet, plant from plant ; at ten years, thinned out to eight feet, which suppose wholly of larch, as the bark is in considerable request, will bring, after paying the expense of thinning, from L.5 to L.7 per acre ; at twenty years, thinned out to sixteen feet, at which distance larch may stand till forty years old ; which thinnings at twenty years, will pay at least L.25 per acre. As it is to be understood the worst and dwarfish trees are always to be taken, the crop on the ground at twenty years will be worth fully that amount. At forty years old, when the larch firs is fit for almost any purpose as timber, and if the growths are ordinary good, will average at least twenty feet a tree, will be worth L.300 per acre. If planted with oaks, to be converted into a natural oak coppice, cut over from the plant at fifteen years old ; supposing oak bark to sell at L.14 per ton, the first cutting will bring from L.30 to L.40 per acre ; and for every twenty or twenty-four years after cuttings, from L.100 or L.150 per acre. This may vary a little according as the ground may not in every acre of it carry the number of plants, trees, or stools without blanks. By haying yearly cuttings, very ordinary wood-lands will pay an annual rent of from L.5 to L.10 per acre, from natural oak, for any length of time without the expense of planting, but keeping good the fences,—and firs by planting every forty years.

QUERY. III.—The probable value of the standing timber at distant periods, specifying those at which it would be the fittest for the naval yards?

ANSWER.—To rear timber for the naval yards; having planted oak, Spanish chesnut, and Scotch elm, the only kinds in general use for the navy, at eight feet distant, plant from plant; at fifteen years, thin out to sixteen feet, taking care always to take out the worst of the plants or trees, dressing up the roots or stools of those cut for the growth. The timber and bark produced from the cuttings at this time will pay from L.7 to L.10 per acre; at thirty years old, thin out to thirty-two feet, tree from tree, always dressing up the cuttings for the growth; the thinnings at thirty years will pay at least L.25 per acre. The trees at thirty-two feet may be reared up to eighty years old, when they will be good timber trees fit for shipbuilding, say from one to two tons of timber each. It may be here proper to observe, that many of the growths from the trees cut over at fifteen years of age, will at the age of forty have made more progress than those from the original plant; so that some of them may be reared with greater advantage and propriety as shipbuilding timber trees, and can also be made to grow more crooked if attended to. By this method a crop of shipbuilding timber trees fit for naval purposes, can, after the first sixty years, be always kept upon the ground; at the same time, when the plantations are of any extent, even granting it were only one hundred acres less or more, a part can be always cut down every year for the naval yards; and part of them reared up

without any expense of replanting, perpetually. The value of an acre of oak, Spanish chesnut, and elm trees, as above, at sixty years old, may be fairly reckoned at or nearly L.400 ; besides, the cuttings from the natural under-wood will have paid a rent of not less than L.3 per acre annually, leaving always a crop of timber trees fit for naval purposes rearing on the ground, reckoning the timber, including bark of such trees, at five shillings per cubical foot ; but this price may vary a little according as the locality of the plantation may be to a market or sea carriage.

Having given you a statement of the probable expense of planting, rearing, and reaping of an acre in its different stages, it will serve for any number of acres, on such soils, &c.

N. B.—If there are neither stones nor timber on the estate, or in the neighbourhood fit for enclosing, the most economical method would be to plant immediately (although the plants were to be bought in,) a few acres wholly with larch firs ; or if in marshy or wet places, with the common willow, as these will come up in the course of a very short time, to afford a sufficient supply of paling, for enclosing 500 acres, year after year. If necessary to have recourse to this method of enclosing, the larch may be planted at two feet six inches, and the willows at two feet, plant from plant. I have known willows fit for paling in three, and larch in six years. If recourse is to be had wholly to a wooden fence, the paling recommended in my Forester's Guide will be found the most sufficient, permanent, and cheapest. I have

been using cast-iron bolts, which I find astonishingly cheap, and ultimately serve the purpose equally well.

SIR,—I now send you a Reply to the Queries in your Letter of the 22d February, which, however trifling, I am sorrow to say, from my engagements on different estates through Scotland preparatory to sales this spring, where my personal attendance was necessary, it was impossible to answer sooner, and will be extremely sorry if my delay has retarded your operations of planting for a single moment, which is of such infinite importance and value; and from the increasing prosperity of the British nation, the demand and rise in price holds out such cheering prospects to landed proprietors. You will easily perceive that in less than forty years, the crop on the ground will be of more value than the land it occupies, and pay a fair rent for the land after the first ten years. I will be most ready to supply you with any farther information from time to time on the subject. I am,

SIR,

Your most obedient Servant,

R. M.

STIRLING, N. B.

19th April 1825.

To JOHN F. BURKE, Esq. Greenwich, Kent.

A REPLY to a request made two years after the Survey had been taken, when the Farms were to be sold.

Sir,—Having only this day had it in my power to lay my hands on the Notes of my Survey, &c. of the Woods and Wood-lands of the farms of Mackroy, and East and West Irons, the property of John M'Farlane, Esq. on Lochfine Side, Argyleshire; I find there is of enclosed and unenclosed wood-lands, chiefly covered with oak and birch, 200 acres; (I beg to say by the way, that with great propriety and advantage more could be added.) The wood-lands on these farms are equal, both as to soil and situation, to the very best in Scotland, and will be as productive of wood and bark at twenty years old, as many natural woods will be at twenty-five years. Supposing these two hundred acres converted wholly into oak coppice, (for which purpose it only requires the blanks to be filled up with oak, and the trash extirpated,) and divided into twenty hags or cuttings, making ten acres to cut annually. At twenty years old, the coppice wood and bark, even allowing bark to keep its present low price, will yield at least L.50 per acre, say L.500 annually; and suppose forty reserve or maiden trees to be reared up on each acre to the age of two cuttings, keeping always a regular succession of forty on each acre amongst the coppice; these will be worth at least L.2 per tree, which at every second cutting will be worth L.80 more per acre; but to reduce the

whole to an average, it will produce L.90 per acre annually, which will be L.900 sterling of yearly income in succession, without any expense of planting, excepting one person as forester, say at L.40 yearly; while the bark, &c. from the thinnings will nearly pay his wages. If you take the locality of these farms into consideration, where the whole of the yearly produce of these barks can be disposed of to the fishermen at a fourth more price than to tanners; it will bring in a very considerable sum more than the above. If you consult the Reports of the produce of the Duke of Montrose's Coppice Woods, and many others, you will see there I am rather, and that too considerably, under than above the annual produce; besides, the Duke of Montrose and others pay, from many places of their woods, twenty-five shillings per ton, to take the barks to a shipping place; whereas the barks from the above farms can be shipped for two shillings per ton.* As the soil of these farms will carry timber trees to maturity, and from its beautiful situation it could be rendered particularly conspicuous and interesting as a gentleman's family residence, were a few acres of the wood-lands laid off for a cottage and garden, and standing ornamental trees reared about it; this would infinitely beautify and immensely add to its value, even 50 per cent. more than the intrinsic value of the cottage and trees, by making it so interesting in the eyes of thousands of strangers passing and repassing this estate by steam navigation; also, a very

* Locality to water carriage is of the greatest consequence in rearing woods.

few small clusters of ever-greens planted on the high knolls would greatly ornament it.

The intrinsic value of the crop on the ground at present, with the exception of the reserve trees, may be considered as not great; but when considered as stools of trees already on the ground that will stand cutting and grow for ages, and as inseparably attached to the ground in so far as the oak stools go, may be, and that very reasonably, estimated at L.20 per acre.

I am,

SIR,

Your most obedient Servant,

R. M.

Stirling, 6th January 1827.

To A. M'KINNON, Esq. Writer, Greenock, Factor.

On the means of ascertaining the comparative tanning powers of all kinds of Barks.

“ DUBLIN, October, 1824.

“ MY highly and justly esteemed friend, Mr PARNELL, of Sackville Street, Dublin, who, it is well known is indefatigable in every thing good and praiseworthy, stands in need of no comment from my pen, sent me the following Treatise on ascertain-

ing the degree of astringency or tanning strength in all kinds of bark, which cannot fail to be of very great importance to dealers in that article, particularly to tanners ; as by this means they can in a few hours ascertain the different degrees of strength in all kinds of bark, of course come at once at its real value ; a thing hitherto unknown but by the long and tedious process of tanning :—

“Of all the manufactures which depend on chemistry for explanation and improvement, that of leather, though highly favoured by the attention of scientific men, is still, perhaps, most in need of their aid.

“Notwithstanding Seguin’s happy discovery of the chemical affinity between tan and gelatine, which promised to introduce something like analytic certainty into his art, the practical tanner is yet unable to estimate the goodness of any bark (previous to its actual use,) otherwise than by its external characters. He depends wholly on the colour, taste, and the healthy brittleness, which in many cases requires an experienced eye to distinguish it from the brittleness produced by decay. By the mere appearance he may indeed discriminate between sound and unsound bark of the same species ; but when both are fresh and healthy, or of different kinds, (for instance, valonia and cork tree bark,) his eye and tongue no longer assist him in determining the proportioned worth of either.

“Any method therefore which would enable the tanner to ascertain with speed and certainty the comparative value of astringents, (of which the market always affords a striking variety) by the examina-

tion of samples, previous to purchase, would be a great step towards rendering his business safe, consistent, and regularly profitable;* and would, no doubt, be the means of introducing general improvements into every branch of the manufacture.

"To arrive at this is the object of the present essay."

* * * *

[Here follow some pages of discussion on modes of valuation formerly proposed, of more interest to the scientific chemist than the manufacturer. We go at once to the matter of *mercantile* importance.]

* * * *

"In endeavouring to strike out an unexceptionable process for the use of tanners, and complete this test in the spirit of utility in which Sir H. Davy had first conceived it, I found it necessary to take a different path from that pursued by Proust and Tromsdorff, who endeavoured by the action of reagents to deprive tan of the various matters naturally combined with it, and which essentially modify its action in every case hitherto brought under our notice. Now, the test required ought to resemble in its action, that which takes place in a tanner's pit; for if the mode of trial adopted differ materially in principle from the manufacturing process which it is framed to aid, any estimate of the value of astringents found on it will be seriously in error. For instance, a tanner's profit

* A friend assures me, that valonia (which is now much in demand amongst tanners at L.28 a ton) was offered to them from Italy, thirty years ago, in any quantity, at L.4 a ton, but in vain; they then had no means of ascertaining its value experimentally.

chiefly depends on the increase of weight which a hide acquires during the process that converts it into leather. This in strong (sole) leather is generally one-third of the dry weight ; or, what tanners are more accustomed to calculate on in Ireland, the finished leather is half the weight of the hide when fresh from the slaughter-house. The extractive matter forms an important part of this weight, and therefore, any test which the manufacturer might apply to ascertain the tanning power of an astringent material, and which acted only on pure tan, would completely mislead him. I am inclined to think that any gallic acid present is also absorbed by the skin. In spent ouze the power of striking black precipitates with solutions of iron is lost, and transferred to the leather, particularly that made with oak bark. In short, the tanner wants something which, when presented to an astringent infusion, will seize on, and enable him to estimate *every thing which would* (in his process on the large scale) *contribute to the weight of his leather.*

“ I know nothing which can do this so well as the skin itself, and I find that by a little management it may be made to yield us the information we require, quicker than has hitherto been thought possible.

“ It cannot be doubted that a strong bull hide will continue to absorb tanning matter for two years, if the process be so arranged ; but if we alter the usual proportion of the materials, the result as to time, will differ exceedingly. If a fresh skin

be shaven down to a very thin substance on a currier's beam, or split into fine leaves by a machine, so as to expose a great expanse of surface, and a quantity of these be steeped in a proportionably small measure of tanner's ouze, they will, in a very few hours, imbibe all its useful tanning substance, and enable him to ascertain, by the difference of weight before and after steeping, the exact quantity of matter in solution, that can be made available in the manufacture of leather.*

"This is a test which comes home to the business of every tanner; one which he can place confidence in, because he can clearly understand it; and though some niceties are requisite in this process also, the line of thought necessary to attain them is already so familiar to him, that I have great hopes it is calculated to become generally useful.

"There can be no question of the correctness of the principle of this plan, it being that in daily operation in every tannery, yet the field is open for improvement, and the exercise of ingenuity in the conduct of it; but having placed the subject within the grasp of the manufacturer, I candidly confess his superior right to prescribe the details in every thing connected with his handicraft operations.

* The strongest ouze in the Dublin tan-yard prepared in the usual cold method, was exhausted of taste and colour by this mode in seven hours; a decoction of valonia, (the strongest I was able to make,) of ap. gr. 1066, was, with the aid of frequent manipulation, to change the ouze in the pores of the skin, deprived of all the astringency in about nine hours.

“ As however, I have made several experiments to ascertain the proper mode of proceeding, and acquired some experience in the matter, I willingly communicate it, and devote the remainder of this paper to hints which I hope may be of service to the tanner in going through the test on his own account.

“ As the object is to constitute a comparison between two or more astringents, and decide quickly on their respective merits, whilst the articles are yet at market, a few pieces should be selected from each lot, so as fairly to represent every parcel. The whole of each sample should be separately ground to powder in a small coffee or pepper-mill, and passed successively through the same sieve, to place each in similar circumstances. From these average samples, the operator may take equal weights, and obtain complete infusions of each, by agitating them with successive portions of warm water till all the soluble matter is extracted.

Though boiling water will hasten the operation, it certainly tends to decompose the astringent liquor afterward, and induces it to deposit a portion of insoluble matter which may interfere with correct results. Water at blood heat (98° Fahr.) may be safely applied ; bottles to infuse and shake the powders in, and a piece of muslin to strain through, serve these purposes completely. Care must, of course, be taken to preserve and return any powdered bark which may remain in the strainer, with the next quantity of warm water. Successive additions in this manner are exceedingly more powerful solvents than the whole quantity

applied at once. Their efficacy increases in a geometrical progression.

“When the several infusions yielded by one sample are united, the average liquor will in general be found sufficiently weak to be acted on by skin with the greatest effect; that is, to afford all the colouring matter along with the tan—an advantage the tanner is prevented from obtaining in strong decoctions of bark. If his experience should lead him to think a particular infusion too strong (which may occur in the examination of astringent extracts similar to kino, rhatany, and catechu,) he may add water to reduce it to what he would call a “safe tanning strength.” Aliquot parts of these infusions (one-sixth of each for instance,) are now to be separately submitted to the action of the test skins (to be described afterwards) which should be carefully handled in the liquors now and then for seven or eight hours, to expose new surfaces to the action of the ouze, till the tanner ascertain, by eye and tongue, that the liquors are absolutely spent.

“There are a number of critical appearances in various operations, altogether undecipherable, and of which inanimate tests give us no warning, and keep no record: In such cases it fortunately happens that the organs of sense give perfect satisfaction to an experienced operator. In the process under consideration, habit renders their decision all-sufficient.

The skins intended for the trial should previously be well washed in tepid water, to extract any lime which they may have absorbed in the process of depilation, together with all the loose gelatine

which can be squeezed out of the pores along with it; so that nothing shall remain but the firm fibre, which will bear handling in the usual manner in weak ouze. They are, after this washing, to be dried in the shade, but not near a fire; then cut up into small pieces to fit the miniature tan-pits, and weighed in lots corresponding with the infusions; each lot containing bulk sufficient to fill up the quantity of ouze, and (like a sponge) present an absorbent surface on every side.

“ This dry skin, as every tanner knows, is in a very unfit state to absorb astringent matter, and become leather. It is, therefore, previous to immersion in the ouze, to be worked with the hands for about five minutes in water just blood-warm (98° Fahr.,) and induced by this treatment to soften and swell to its former dimensions, in which state it will be capable of fully exerting its absorbent powers; and if care be taken to give the ouze an over dose of it, the action will be completed in a few hours.

“ As each ouze is exhausted, its lots of skins should be taken up, dried in the shade as before, and the increase of weight in each lot separately ascertained. This additional weight can consist only of the useful tanning matter, so that the increase of each lot will directly show the true comparative value of the astringent in whose infusion it was steeped.

“ The skin most proper for this purpose is the strongest and freshest that can be procured, shaved down or split to the thinnest substance it can be safely reduced to. The large fresh currier's shavings from the strong hides intended for chaises or

harness, can be obtained in quantity, and are well adapted to the process. The skins of ill-fed sheep and cattle that come to market hide-bound from the mountain districts, as well as those of aged cattle in general, are also strong and fibrous enough for the purpose; but what I would prefer to all other (from the description I have received) are ox-hides split very thin and evenly by the patent machine.

"In Birmingham, I am informed, this branch of the leather manufacture is well understood. In Dublin, we have but one splitting machine, and that is only constructed for splitting sheep skins. These, from the improvement that has taken place in our breed of sheep, are generally so full of fat, that they are quite unfit to act as a test in this case, the oil shielding the skin from the action of the tan, and where it exists in the greatest quantity, along the back and across the neck, retarding the evaporation of moisture during the two drying processes, and consequently leading to false results.

"Calf skins, shaven down to the thinness of split sheep skins, are free enough from oil, but the fibre is in general so delicate, that it is liable to be injured, and partially dissolved, or rather dispersed through the warm water during the softening and swelling, preparatory to steeping in the astringent infusion. I found that several lots of this skin, previously dried and weighed for experiment, though beautifully transparent, and apparently perfect in every way, lost seven per cent. of loose gelatine when handled in tepid water. Thus this species of skin also appears improper for the purpose.

(GRATIS CIRCULAR.)

YOUNG PLANTATIONS.

[The following Circular was sent to a number of Noblemen and other landed proprietors in 1826, a year of unprecedented drought, which will be long remembered, and may not be altogether uninteresting, should the like again happen.]

MY LORDS AND GENTLEMEN,—In this year of unprecedented drought, I am well aware that your young plantations must be suffering very severely, especially what has been planted this season, and particularly where planted on dry rocky soils. (This I am the more convinced of, not only from what I have seen personally on different estates, and in various parts of the country; but also from the numerous applications, being nearly 200, already come to hand, from different Noblemen and Gentlemen in England, Scotland, and Ireland, asking advice as to what possible course they should take to recover or save their plantations, some of which being of very great extent, and which appear at present to be a total failure, must occasion an immense expense in plants and in replanting.) Being well aware, that there are also many who have not as yet applied to me for advice, whose plantations may be in a similar situation, I thought of printing this Circular, containing the following hints, and sending it to those Noblemen and Gentlemen who have honoured me with their employment; and should they be the means (of which I have no doubt

from former experience) of saving all or any part of their young plantations, I will feel myself most amply rewarded :—

OAKS, &c.—Where the plants of oak, Spanish chesnut, elm, (Scotch or English,) ash, plane, sycamore, horse chesnut, birch, and alder, (and in some parts of England and in the most of Ireland, the beech) have failed in the top, and are by no means likely to recover ; cut them over close by the ground, trampling and firming the roots well in the earth before cutting off the top, and be sure to cut the plant close to the surface of the ground when trampled down ; let this be done in all plantations where there is no risk of the young shoots (numbers of which will yet come away during autumn) being destroyed by game, such as deer, hares, rabbits, &c. in this month, and particularly before the end of September ; where there is a risk of the young growths being destroyed during the winter by game, let all such be cut over in the months of December and January ; thus by having their roots firmed in the earth, the roots will be growing every day of vegetative weather during winter, and will, in the spring, send out most vigorous growths ; there being no risk of the roots losing the growth by the top of the plant shaking with the winter winds. The same method should be attended to with all plants, even two, three, or five years planted, if dead in the top ; and not to depend on their side shoots, although fresh, as they never make a proper tree.—*Vide* my Forester's Guide, 1824.

RINS.—From the strong gales of wind we have

had in most parts of the country, within these three weeks past, I have found great numbers of the firs, particularly those in exposed situations, very much loosened in the roots, which has been the means of killing more of them than the drought, by admitting the air to the roots, and destroying the moisture, which kills the roots, although the soil is good and deep. If the following is attended to immediately,—going through and carefully firming them at the roots, many of them may yet be saved; not a moment should be lost in attending to this. Where top shoots of the spruce and silver firs are dead, and the under shoots healthy, the top shoots should be cut off. I have found this always, where they had sap in the roots, to save the life of the plant or tree when the side roots are healthy; it will be found to answer the purpose completely, when the firs are intended chiefly for nurses; but when they are intended to be reared as ornamental trees, this sometimes causes them to grow horizontal or crooked.

LAYERING NATURAL OAK WOODS.—To those noblemen and gentlemen in the Highlands of Scotland, who have extensive tracts of natural oak wood, I beg to say, that I was aware, before hearing from many of you, that the layering from the young oak shoots would be a complete failure this season. To those of you who have been going on with the plan of layering, and who have planted hundreds of acres in this way, and are convinced of the utility of the method, having seen stronger and better growths in two years from the layers;

than in five or six years from the plants, I need say little, as what you have lost this season you will gain next; nor will you be wanting in growths through the autumn, now when the season is set in moist. As a proof of this, you need only look back to former years. To those who have only tried the system of layering for the first time this season, I beg to say, you must not despair, as it has been proved, to a demonstration, to succeed. Where you have depth of soil, you will have growths yet in autumn, but particularly in spring; but I observe, what you say, that where the soil is very bare, and particularly where you have laid the layer over rocks, the branch or layer seems in many cases to lie dead; nothing else than this could be expected in a season like this, not having a drop of rain or moisture since layered in, and no depth of soil to make the fibres stretch for roots; this will be particularly the case where the incision in the layer has been much cut through, as by this means the sap or nourishment from the old stools is completely cut off, which should have supplied it till the fibres in the layer became roots, which is not, nor can it be expected, till the layers have had a whole year's growth. In this case, a spadeful of fresh earth should immediately, during this month if possible, be laid on them, and the pins well firmed in. The laying a little fresh earth on them, I mean only in all bare rocky places, will preserve them and keep them moist till next season; taking care not to disengage the layer from the old stool; and although they may receive but

little sap from the old stool, yet they will, if an ordinary moist season, receive as much as make them take root, and form themselves; by attending to this, you will have, in many instances, growths this autumn, but particularly next spring. Although they may not have sent out a green blade this season, there is not the slightest room to despair.*

Again, to those who have only tried the method of layering for the first time this season, their failure, I grant is particularly discouraging; yet the utility of layering and cutting over, by many years experience, is incontrovertible, and can be attested by thousands; and by attending to the foregoing method, I am perfectly assured it will save the expense of replanting.

I beg to observe, before taking my leave of you, that this season I have observed, both in different places of Scotland and Ireland, many trees in plantations of twenty and thirty years old, which had previously been most vigorous in their growth, completely dead in the tops; although the buds came out, they never bladed; but these are chiefly in plantations where the ground is over-burdened for want of timely thinning; these, however,

* Since the above was circulated, I had occasion, so late as November, to be on the estate of Duntroon, in Argyleshire, the property of Niel Malcolm, Esq. where his forester, James Gow, had layered down not fewer than 50,000 oak and Spanish chesnut, early in spring, in one plantation, from natural shoots, &c. and not five layers out of the hundred, on an average, had failed; a great many of them had made fine shoots of from two to three feet, and were very healthy. The Spanish chesnuts were particularly promising notwithstanding the drought.

may recover next season ; but still it would be well, in all such cases, to thin a little, as want of timely thinning often stints the growth of the whole plantation, particularly in such a season as this, for when the ground is over-burdened, recovery is doubtful.

I have the honour to remain,

MY LORDS AND GENTLEMEN,

Your most obedient and very faithful Servant,

R. M.

Edinburgh, 14th August 1826.

WINNOWING MACHINE.

[A pattern of the Machine, with the following letter, was sent to the first meeting of the Highland Society at Glasgow, and I have no doubt but its great utility will be duly appreciated in wet harvests, particularly in the Western Islands, and its place here not ungratifying to many of my readers.]

To the Noblemen and Gentlemen, Members of the Committee of the Highland Society, to meet at Glasgow, 27th Sep. 1826.

MY LORDS AND GENTLEMEN,—It is a well known fact, that, in the Highlands of Scotland, particularly Argyleshire and the Islands, it is almost impossible to get the crop (chiefly oats and beer) from

the wetness of the climate, gathered in, in a wholesome state, either for man or beast; and oftentimes a great expense is incurred in removing it to high land, and in turning it over to dry, &c. It is well known that His Grace the Duke of Argyle, erected barns at an expense of L.10,000 in the neighbourhood of Inverary, for the purpose of winnowing the crop. It is with a view to secure to the farmer, at a very trifling expense, his crop of corn, &c. that he may have wholesome food for man and beast, that I beg leave to lay before you a model of a simple machine, by the use of which, corn of every description may be winnowed in a very few days, in place of sometimes taking a great many weeks, and preserve the grain in good order, notwithstanding continued rains. As the model of this machine shows at once, to the most superficial observer, the method of drying or winnowing corn, little need be said in explanation of it; all that is necessary is, that the machine be made of sufficient height and strength to keep the sheaves off the damp ground, so that it may turn round with the wind, the sheaves being put on the forks of the machine; when placed in such a situation, an hour of dry weather will completely dry the sheaves, after having been drenched with rain.

OBJECTIONS AGAINST THE UTILITY OF THIS MACHINE.

I. It will take a very long time to put a sheaf on the machine.—In reply,—It has been tried repeatedly, and allowed, at all hands, that it is as soon put on the machine as in the shock.

II. It loses the grass out of the bottom of the sheaf.—This is sometimes the case; but what falls out can be very easily raked off the field after, without any loss.

III. The expense will be great.—But not so; the strong part of the machine can be made of cast iron, or wood, and the turning part of strong wire; so that they will not cost above, (as I am informed,) from 1s. 6d. to 2s. each, sufficient to hold from six to twelve sheaves, and will last a farmer for generations; and as corn can, in this way, be winnowed in a very few days, a few will serve a farm, being so very portable that they can be taken from field to field: even were it to cost a little more, no farmer but would think it well bestowed, when he calculates upon the difficulty, risk, expense, and even the loss of grain he is obliged to sustain almost every season, but particularly in wet seasons. But I aver, that the very reverse will be the case, as by this means he will always save his grain at less expense, and its utility is immense, every where in wet seasons, when put in practice.

Observe, the sheaf must be tied a little above the middle, the band of the sheaf fixed on the forks, and the bottom spread out, so that being entirely off the ground, and turning round on the machine, it admits of the air in every direction; nor will heavy pouring of rain injure it, as it runs off the straw as it falls; an hour's dry weather, at all times, will fit it for the barn-yard after being winnowed. Three small poles of wood, little thicker than a corn fork handle, turning on a bolt at the top, set up and spread out at the ground in

form of a triangle, and with hooks on them to hang the sheaves on ; or a hoop put round with hooks to put the sheaves on, either of the ways will be found simple and of very trifling expense.

I have the honour to be,

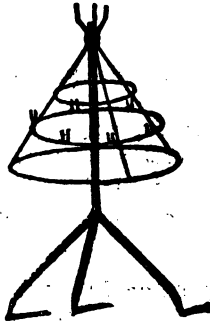
MY LORDS AND GENTLEMEN,

Your most obedient and very humble Servant,

R. M.

Stirling, 21st September 1826.

Sketch of a Winnowing Machine.



INTRODUCTION

TO THE

PLANTATIONS IN IRELAND,

SURVEYED IN 1826.

I use great plainness of speech.

I hate the sophistry of words,
Which only cause contentious spite,
By experience lead to what affords,
With demonstration, sure profit.

THE following remarks and methods of improvement on Woods and Plantations on sundry estates, are principally intended for the perusal and assistance of the planter and forester, so that an attempt at fine language, or a strict adherence to the niceties of grammar, are neither necessary nor attended to. My whole intention is, to state the improvements that could and that should be made, with great advantage to the properties, both as to profit and ornament, with the best and most advantageous method of executing them, so as to be easily understood by those who may have the operative man-

agement.—Having always made it my creed to probe the wound to the bottom, though simply, yet plainly—fearlessly, yet candidly and honestly, before applying the remedy. Without pointing out the disease, it would be of no use to prescribe a cure; in doing so, it of necessity has been my painful duty to bring into notice, as I went along, the mismanagement of these woods, trees, and plantations. In doing so, I beg it to be understood, that I have not the most distant view to personalities, being perfectly ignorant as to who had the management of them. Hoping that the few hints will serve as a beacon, not to make shipwreck again of such beautiful plantations and trees, upon the same rock, suffice it to say, that the planter and rearer of timber, in every part of Great Britain, does and will reap immense and incalculable advantages therefrom, when properly attended to; but particularly in Ireland, which, for the far greater part, in point of improvements in agriculture, is at least one hundred years behind her sister kingdoms. Throwing this consideration alone into the scale, it should have its due weight with landed proprietors in that country, as regarding the interest of the nation, themselves, and their posterity. It is plain to a demonstration, that when once Ireland shall have arrived at that degree of perfection in agricultural improvement, to which I am happy to see, from the enterprising spirit to improve by planting, of some of her noblemen, she is advancing, though slowly, there would not be in the country a tenth part of the timber necessary to supply the internal demand for agricultural

purposes alone.* I am decidedly of opinion, that the landed proprietor who plants or improves large tracts of waste or poor land, does more for the real substantial good, or future independence (or the emancipation if you will) of Ireland, laying his own private interests aside, than all the bewildering schemes of many nameless individuals. Besides clothing the nakedness and barrenness of the kingdom, it will in a very short time enrich the landed proprietor, and so soon as set about with spirit, will instantly afford bread and clothing in abundance, to thousands of naked and half-starving labourers. From the locality of my present subject, as it only regards a few noble individuals, and their private property, it would, I fear, be deemed improper to be more public; time alone, and those who embark in it, will prove the justness of the remark. Let it be carefully noticed, and always kept in view, that in going over in the way of a survey, of woods and plantations, it is impossible I could condescend upon the particular number of trees, where it is necessary to suggest the propriety of a thinning, that should be taken out; but from the hints given, and the methods laid down to be followed up, any person, of but ordinary skill and judgment in forestry, will be at no loss to discover all such. In all wooded estates it is worthy the proprietor's special attention, and always tends to his advantage, as well as to the improvement of his property, and also to his ob-

* The greater part of the few implements required for this purpose, are at present sent from England and Scotland.

taining a perfect knowledge of his increasing annual income, to have his woods, plantations, woodlands, and timber trees surveyed, valued, and put on a proper system of improvement by a professional person, who, if worthy of trust, will take special care, candidly, honestly, and without partiality, to state the improvements that should and that could be made with propriety, advantage, and profit, with the best, speediest, safest, and cheapest method of executing them.

A most excellent and satisfactory plan for all concerned, when a system of improvement is adopted, and agreed on by the proprietor, and put into the hands of the factor, forester, or operative manager, particularly when printed, is to bind in a quantity of blank paper at the end of the report on every distinct plantation or farm, in the form of a book, in which the proprietor notes down his instructions to the factor, forester, or operative manager, so that he goes on in safety, and if attentive and industrious, with satisfaction to his employer. Also the manager or forester noting down, on his part, the expense or time consumed in making all such improvements when finished, &c.; also the sums of money received for the thinnings and cuttings, and to what purpose applied, &c. The proprietor and servants keeping each a distinct book, and comparing them occasionally. When this plan is judiciously attended to, it affords peace of mind to the proprietor, particularly so when he (the proprietor) cannot always reside on the estate, whereby, at whatsoever distance, he can have a perfect knowledge of what is going on at all times and oc-

visions on all parts of his estate. I have oftentimes, particularly on extensive wooded estates, numbered and valued the whole standing timber trees and plantations according to the aforesaid plan, distinctly marking and valuing all such as may be cut for the improvement of the woods and plantations; and distinguishing, marking, and valuing all such as may be cut without injury to the look of the woods and plantations, so that the proprietor knows to a certainty, or nearly so, the annual produce or yearly income he can receive from his woods; and should at any time a pressing necessity for a little more money than his yearly income be wanted, he can have recourse to those trees that may be cut without injury to the look of the woods or plantations. Such a plan of arrangement will serve the woods and wood lands on every estate for forty years or more, and it will serve the cuttings of natural coppice woods for all time coming, when once brought into annual general cuttings, and cannot fail of affording the most universal satisfaction to all concerned for the future.

In making all such surveys, I am particularly careful to select and describe all such trees as will suit the particular soil and situation, attentively pointing out and recommending all such trees as will live to the greatest age, become the most magnificent, large, and ornamental trees, and which, by their increasing magnitude, will give dignity, antiquity, and grandeur to the domain or estate, to be reared up to perpetuity. Always keeping in view, that though an estate or domain may be possessed of many natural beauties, yet trees are the

golden fringe which adorn nature's noblest and grandest garment: clad in these, she is *not* only infinitely beautiful, but transcendently excellent; such will the eye ever admire! Strip nature of trees, and she looks like a naked man in a winter day, disgusting to the eye, and shuddering to the heart—strip nature of trees, and there is a blank which no human art or ingenuity can supply, whether we view them as a national or individual ornament or profit. The proprietor who rears up and spares old healthy trees of oak, Spanish chesnut, bequeathes an invaluable treasure to his posterity;* and he who

* Let loves own altar honour'd be,
Spare, woodman spare, the beechen tree.

Lord Byron's fine simile, written beneath an elm in the church-yard of Harrow-on-the-Hill, September 2, 1807, will be acceptable to every lover of trees:—

Spot of my youth! whose hoary branches sigh,
Swept by the breeze that fans thy cloudless sky;
Where now alone, I muse, who oft have trod,
With those I lov'd, thy soft and verdant sod;
With those, who scattered far, perchance deplore,
Like me, the happy scenes they knew before;
Oh! as I trace again thy winding hill,
Mine eyes admire, my heart adores thee still,
Thou drooping elm, beneath whose boughs I lay,
And frequent mus'd the twilight hours away;
Where, as they once were wont, my limbs recline,
But ah! without the thoughts which then were mine;
How do thy branches, moaning to the blast,
Invite the bosom to recall the past,
And seem to whisper, as they gently swell,
"Take while thou canst, a lingering, last farewell!"
When Fate shall chill at length this fever'd breast,
And calm its cares and passions into rest;

cuts them down, robs his posterity for many generations, and his country of its greatest beauty, boast, and bulwark. Britain had better be without gold than without timber.

Oft have I thought 'twould soothe my dying hour,
 If aught may soothe, when life resigns her power,
 To know some humbler grave, some narrow cell,
 Would hide my bosom, where it lov'd to dwell;
 With this fond dream, methinks 'twere sweet to die,
 And here it linger'd, here my heart might lie;
 Here might I sleep, where all my hopes arose,
 Scene of my youth, and couch of my repose;
 For ever stretch'd beneath this mantling shade,
 Prest by the turf where once my childhood played,
 Wrapt by the soil that veils the spot I lov'd,
 Mix'd with the earth o'er which my footsteps mov'd,
 Blest by the tongues that charm'd my youthful ear,
 Mourn'd by the few my soul acknowledg'd here,
 Deplor'd by those in early days allied,
 And unremember'd by the world beside.

SURVEYS, REPORTS, &c.

No. I.

The Elms near the Approach Gate to Powerscourt Mansion.

THESE trees, on both sides of the public road, chiefly elms, must be allowed at all hands do give a very dignified, sublimely grand, ancient, and venerable appearance to the approach to the mansion. Notwithstanding their unprotected situation, being close on the public road, and the little care or attention that has been paid to the rearing of them, they have raised their magnificent heads to the sky and bid defiance to the storms and tempests that have within their lifetime overturned and reduced to a heap of ruins the strongest and most stately edifices, built by human ingenuity and art, and speak in that beautiful language of inspiration, "man is as a shadow that departed, compared with us." I am sorry to say that it bespeaks a degree of carelessness

seldom to be met with, in allowing these noblest of nature's productions to fall into decay, when a very little work and attention would be the means of preserving them in all their grandeur for another century. The first and sixth on the right, approaching to the gate, have each lost the top of the trunk; these should be cut over, and if found decaying in the heart, should be covered over with a piece of lead or other substance; they would thus send out most vigorous shoots, gain a new top as a pollard, become as beautiful as ever in a few years, and stand so for generations, while their trunks are preserved; this may be seen by the fine, fresh, and healthy shoots they are at present sending out, notwithstanding the decaying and decayed state of their boles. No plan could more efficiently have been taken to destroy and hasten to decay these trees, than the method in which they have been pruned, by cutting the large branches at a distance from the trunk of the tree, and allowing them to rot off, which ~~never fails to~~ leave a hole to admit of water, &c. and which ultimately rots the whole tree. All these branches and places should be most carefully and properly dressed up, smoothed into the body of the tree, and if there is already a hole or symptom of decay, it should be covered over as aforesaid; and if the place is sound when dressed up, it should be covered over with coal-tar paint, or a balsam prepared for the purpose of preserving the wet from getting in, or the sun from opening the pores of the timber to admit the wet. Is not Shakespeare's fine lines very appropriate to those trees:

"Their boughs are mow'd with age,
And high tops bald with dry antiquity."

E

No. II.

Clump opposite the Approach Gate.

This clump of old trees, however small in size, from its elevated situation, has a most beautiful appearance to a stranger, when walking or driving up the avenue just before described. The whole of the trees should be kept up with the greatest care; not a single tree should be cut out of it; and should any of them die in the top, by being whipped by its neighbouring tree, it should be immediately cut over and pollarded; a few ever-green shrubs could be put in amongst their roots with propriety and advantage; four trees of spruce and silver firs, say two of each, could be put into the blank ground, on the south side, and reared up to maturity, to stand in a triangular form, looking down the avenue. On the right, in entering the gate, there is a fine beech tree, most miserably pruned, and that too very lately; the branches should be immediately cut close into the tree, as formerly directed, otherwise it will very soon kill the tree. Nothing can be more ruinous and destructive than a system of pruning of this kind. In approaching the gate on the left, are two larch firs, which are destroying the ever-green laurels, nor will they ever be ornamental trees. They should be immediately taken out, before they do any more harm. The young spruce firs towards the fence should be cultivated with care; rear as many of them up as will stand in a triangular form to cover the view of the field. The young larch firs should be taken out. Prune properly, dress, and cover up the wounds in

the fine old trees here, in order to preserve them as long as possible from decay.

No. III.

Left side the Approach Gate to the Mansion, within the Gate.

At the back of the gate-house or lodge, take away the ash that is whipping, destroying, and overtopping a fine ornamental beech ; as the beech will be by far the most ornamental and long-lived tree, it should get scope, and the ash never will be a proper tree, from the manner it has been abused in the pruning. Farther on the left is a clump of fine old trees, many of which have also been abused in the pruning. As these trees not only afford shelter to the adjoining fields, &c. but are also beautifying and ornamental to the place—not a single tree should be cut out of them. When any of the hard wood trees die in the top, it should be immediately cut over as a pollard. The whole of the hard wood trees that are abused in the pruning should be examined carefully, and all the spoiled places and blemishes dressed properly up and covered over, so as not to admit of water into the bowels of the tree. Several fine pollard trees of beech are to be seen here, which proves to a demonstration, that pollarding such trees as I refer to, will be a means of preserving them as ornamental trees for ages, after it may be supposed they were lost for ever ; and in this and all such places, to preserve a tree for ornament is of the very greatest importance. A little farther on, left side, close to the approach, is

a fine healthy ash, with one of the top branches broke, and lying over on a fine beech, which has been allowed to do so, it appears, for at least a whole season, which is not only destroying the ash but also the beech it lies on; and if not remedied, will in time be the means of killing both trees, which, of course, would make a dreadful blank: this is a degree of carelessness that deserves to be severely reprimanded. The branch should be cut off the ash, and the place where it is broke at present, dressed up, as also the branch it has destroyed on the beech, and that immediately. On the north side of the approach—as the whole of the trees here, as well as those described, and the whole on both sides leading to the mansion, give an infinite dignity and ancient grandeur to the place, altogether indescribable, the greatest possible care, and every thing that human art or ingenuity can devise, should be applied, to preserve as long as possible their growth and appearance as trees; not a single tree should be cut, nor so much as a healthy branch should ever be cut off any of them. When a single branch is broken off any of them by the wind, or otherwise, the place where it is broke should be immediately dressed up, and covered over as aforesaid; when any of them die in the top, it should be cut over, and pollarded; even when they die in the roots, they should be allowed to stand as long as there is a green blade from them, and till other trees, if possible, be reared in their place.

No. IV.

Beech-Grove.

From the gate on both sides of the approach, close

to the mansion, there are a number of very fine tall magnificent trees, and for the most part they are very healthy; still there is also manifest the greatest want of care and attention in not dressing up the wounds and broken branches on them, in order, as long as possible, to preserve the health and growth of these fine trees; which, from the situation they occupy, when a single tree is taken away, it makes a dreadful blank, and such as may reasonably be supposed will take at least three lifetimes to replace. I may remark, that had these trees, and the others I have just been describing, been thinned in time, say when they first arrived at a height of sixteen, or not exceeding twenty feet, they, by getting scope to branch out, would have been much larger, more ornamental, and more beautiful trees. I would here beg leave, as I go along, to observe once for all, that whenever a plantation is intended for standing ornamental timber trees, they should be thinned out regularly and gradually, first at the height of six, or not exceeding eight to nine feet; at the height of twelve, or not exceeding sixteen feet; (say eight or ten years after) to eighteen feet, tree from tree, at the height of from twenty to twenty-four feet, to thirty-six feet, tree from tree, or as near as can be, at which, if in a very exposed situation, they may stand as a finished grove or lawn of timber trees, taking special care always to leave the best and most healthy long-lived trees; if underwood is necessary, keep the ground always full with underwood from the cuttings. But to return from the height,—these trees having arrived at the length of time they have stood in such an exposed situation, it would be im-

possible to cut away a single tree without injury to its neighbouring tree, either by stinting it in its growth for a number of years, exposing it to be blown down by the storm, or altogether killing it; therefore a single tree cannot be taken out here with safety, nor with any degree of propriety. It will be told me what is very true, that many of these trees stand so close together, that they are evidently killing each other, and if allowed to stand many more years together, both trees will not only be injured, but actually killed; then there will be nothing but a blank, no tree at all; there are a number of blanks already, and perhaps from this very one cause; it is therefore certainly much better to take away one tree and save the other, than allow both to be lost; you say take away one tree, it will kill the other—the very one it was taken away to preserve, you say may be blown down by the wind, and make a blank; this may happen, the world may soon come to an end, and there will be an end of the trees also; this, I grant, is all fair and rational; we are here treading on sacred ground, and the person that would cut away a single tree here, which has required centuries to rear, at the risk of a supposed improvement, would be committing a crime. There is, however, a plan and method left of preserving and keeping a crop on the ground, of these grandest of nature's productions, even in their exposed situation and neglected state; and I beg permission to say, that the managers of all estates would do well to deliberate seriously before cutting old full-grown trees in this and all similar places. The plan to be followed up in preserving these trees, in this and similar places

where the one tree is evidently destroying its neighbouring tree, or destroying each other, so as both will shortly die if not remedied, is to cut over one of the trees for a pollard; in so doing, the greatest attention and skill is requisite, taking care to cut it as high up as it possibly can be done, to clear and relieve the other tree, leaving always all the healthy branches on the outside of the pollard; and rather than cut the main trunk of the tree not to be the pollard, take a branch or two off the side of it that is injuring the tree to remain. Suppose another case, when two trees are very close together, and one of them could be spared altogether, should one of them be taken away all at once, the top of the tree left will be, most likely, completely bare of branches on the one side,—the side pressed on by the other tree,—and will have a miserable appearance as a tree, and it is ten to one if ever it will have a proper look as an ornamental tree. To remedy this, and to have in a few years a beautiful tree, cut as a pollard, the most healthy and best of the two trees, say the one intended to stand as the most ornamental tree, keeping, as abovementioned, the trunk of it as high as possible, and all the healthy branches on it below where the trunk is cut, allowing the other tree to stand so as not only to shelter it till it sends out its new branches, and forms its top, but also to keep the space full with the look of a tree till such time as the pollard has formed its top properly, when the other tree may be taken away; and no deficiency of a tree will be perceivable, as the pollard will soon cover much more ground than they did both together, and be a much more beautiful tree than one standing with

only a half top, say the top all on one side; by attending to this, a crop of fine trees will, for ages, be kept on the ground. Where there are already blanks in this and the aforesaid plantations, these should be filled up with plants of oak, Spanish chesnut, English elm, plane and lime trees; when these are put in, enclose them singly with my portable paling, (*See Forester's Guide*,) which is both elegant, durable, and cheap. I have been the more particular with the trees here, as they hold a most distinguished part and situation on the demesne, and require immediate attention, and should I meet with any other trees or clusters of planting requiring the same treatment, I will only give a reference to this. It is agreed at all hands, that nothing beautifies or makes a nobleman's mansion look more antique, than to have fine large old venerable trees, and the greatest imaginable attention should be paid to the preserving and keeping up all such trees. The making of pollard trees in places of this kind is of great use when large trees are transplanted; the best method I have always found in doing it is, to pollard the trees to be transplanted two or three years before transplanting them, so as they may be forming a top.

No. V.

Large Trees along a Private Family Walk.

Here are to be seen a number of very fine venerable old English elms, which are, in so far as I have seen, a very great rarity in this country. Indeed

such magnificent and sublimely grand trees are seldom to be met with any where. Here I am extremely sorry to have again to lament the deplorable neglect of these noblest of nature's productions. In order to hasten the decay, and to consign to oblivion the fine row of these trees along the garden wall, in front of the mansion, which perhaps cost some of their ancient proprietors many a waking night, some fratricide has in a most cruel and wanton manner cut the roots off the whole of them from one end to the other, to the depth of two feet and upwards, and that too within three or four feet of the trunk of the trees, which, in plain language, is to say, get thee gone thou dandled darlings of nature's children, which have been dandled on the lap of nature for centuries, and let a garden-cabbage or shrub take your place—which, like Jonah's gourd, is reared in a night, and perishes in a night. Had I the overcharge of these woods, trees, &c. I could hardly ever forgive the servant who dared to put forth his hand to injure them; his situation would hardly atone for such a crime—it is well I know not the man, or his name as aforesaid would swell the pages of history.—Were trees, like any other crop, sown in spring and cut down in full maturity in autumn, this or something like it might have passed over, but the hand that plants can never see them reaped in maturity, therefore I say, once for all, that trees planted for shelter and ornament should never be cut down, particularly when arrived at such a degree of perfection, without consultation and due deliberation. Even the proprietor himself may have to regret, when too late, the cutting or taking down of such trees,

particularly in such a situation, where they give so much beauty and antiquity to such a grand mansion. The beautiful lines of the poet, so apropos, plead an excuse for using them :—

“ The Elms are fill'd and adieu to the shade,
And the whispering sound of the cool colonade,
The winds play no longer and sing in their leaves,
Nor the Ouse on its surface their image receives.
—Years had elasp'd since I last took a view
Of my favourite field and the place where they grew,
When behold on their sides in the grass they were laid,
And I sat on the trees under which I had stray'd;
The black bird has sought out another retreat,
Where the Hazels afford him a screen from the heat,
And the scene where his notes have oft charmed me before,
Shall resound with his south flowing ditty no more.
My fugitive years are all passing away,
And I must myself lie as lowly as they,
With a turf at my breast and a stone at my head,
Ere another such grove rises up in its stead.”

There are a few of these trees spoiled in the top; they should immediately be cut over as pollards, about six feet at least above the garden wall; the trunk, if hollow, covered over to prevent any further decay, and allowed then to pollard, and the blemished parts carefully dressed up, as directed in No. IV. The undermining and cutting of the roots should be carefully filled with good earth, and never again reopened. The pollard elm at the north-east end of the mansion, is a beautiful specimen of the degree of perfection that a pollard can be brought to by attention and care. In the management of young plantations it is altogether different, although they have even arrived at the age of fifty, or say sixty years; in this case, when the trees are vigorous in

growth, a proper selection should be made, leaving always the more healthy and thriving, and such as are likely to be the longest lived trees. Although those left may happen to have a bad top on one side, spoiled with its neighbouring tree, from its healthy and vigorous growth, it will soon gather and recover; in cases of this kind, they should always be allowed room and scope; by the cutting or destroying of the trees in question, in one unlucky moment, if we compare the future with the past, the work of five or six generations is spoiled. Where is the man, in his thinking moments, knowing the proprietor's absence, that would risk the daring attempt. If there was such a man, generations yet unborn will curse his bones while rotting in the dust. I could give many names of places, where the proprietors, in an unthinking moment, had cut down old timber trees about pleasure grounds, and afterwards repented to such a degree, that when looking on the awful blank, totally unable to supply its place, although they should give all they had; sad remorse made them forsake the ancient demesne of their forefathers. The old trees on both sides the garden wall, so long as protected from the hands of the assassin, and a green blade flourishes on them, their venerable tops will nod in solemn silence, and proclaim peace to the slumbering ashes of their ancient proprietors, who planted, protected, and reared them to such perfection.*

* The roots of the fine trees referred to, were cut at the suggestion of the gardener, to stop them from running into the garden. I only learned this lately, and near twelve months after this report was written.

No. VI.

Silver Dale.

This den or ravine, on both sides the run of water, has in many places considerable blanks, which should be filled up, where dry, with oak, Spanish chesnut, and, to give variety to its look, spruce and silver firs. At the top of this there are some fine old ash trees, covered with ivy, which is a great ornament to the place; and to a person standing within a few yards of them, they have a most impressive effect, and call up to mind the inexorable calm pace with which time has passed over them, marking with his ravages, destruction in every step; their boughs falling to pieces, and trunks tumbling over their hollow base with age; methinks religion raises her supplicating eyes to plead for a release in vain—in vain philosophy, with all her wise maxims, and melody, with her sublime songs—in vain could they combined, touch the cold unfeeling heart of time. Yet methinks the awful tyrant, totally unused to spare, relented when he struck their finished pride, and partly to repair the ravages his sweeping hand has made, and to renew in green verdure those brightest gems of nature, ties up their tottering trunks with twisted ivy. How indescribably beautiful are these dead trees in their grave clothes, returning to their original nothing, clothed in their ivy-mantled shroud. If I durst but give scope to my flying imagination for a moment, to an infinitely more grand and sublime subject, and take a peep at the noblest of all God's works falling to pieces in the grave; but the immortal part,

clad in the ever-green ivy of a Redeemer's righteousness, woven in the loom of his obedience, and dyed in his atoning blood, will shine in all the verdure of youthful beauty through eternal ages—but hold, the subject is too sublime for my unworthy pencil, and has rivetted me too long to the enchanting spot—farewell! ye perfections of nature's beauties.

Both sides here would make a fine bank for natural oak coppice; but so near the pleasure grounds, I am of opinion it should be kept full on both sides with ornamental trees. Where the bank is wet, it should be drained and planted up as aforesaid; some places here that could not be altogether drained, from their marshy nature, may very advantageously be planted up with the willow, or black poplar, which will grow well in wet places. Some alders in this bank, which never will be profitable trees, should be cut out, as also all brush-wood and rubbish, before planting up the places referred to.

The trees referred to were very large old trees, from 80 to 120 feet high; all their small branches were fallen off them by decay, and their large broken arms, or rather stumps, stretched several feet out from the trunks, covered with green ivy over their highest tops, were enchantingly beautiful.

No. VII.

Young Plantation.

This young plantation does not seem to be doing so well as might be expected, and nothing will, I fear, bring it to be a plantation but perseverance, by keep-

ing it always full of plants. There are too many Scotch and larch fir trees, none of which answer the soil well; the common spruce fir will do better; but the oak, the plane, the beech, and ash, will be the only trees that will come to maturity as timber trees here. The blanks should be completely filled up with these kinds, and regularly cut over till they are past the danger of dying; the most of the ash plants should be cut over this season, close by the surface of the ground. This, from its proximity to the last bank described, should be reared as a standing clump of timber trees, and regularly thinned as it comes up, as already laid down in No. IV. plantation. The old wooded bank, looking down on the river, requires a few plants put in—keep up the old trees—the plants to be put in must be enclosed singly, as the expense of enclosing the whole would be too great for the few trees required. Plant with Spanish chesnut, ash, and elm, and enclose them singly with my portable paling, as before recommended. As this is a very thin bare soil, all the oak, ash, and plane plants should be large when put in, so as to have strong good roots, and cut the top off them close by the surface so soon as put into the ground, as there is little or no sward growing to injure the plants; the fir plants should only be two year old seedlings when put in, say not above six or eight inches long.

No. VIII.

Field.

The bank here, below the old burying-ground of Churchtown, is much in want of filling up, as it is fit

for nothing else but trees; - it should be kept fall; plant and enclose singly, oak, Spanish chestnut, plane, and Scotch elm, to be reared as standing timber trees. The bank to the west is a most excellent bank for growing or rearing trees of every description; and the present trees upon the ground are no crop, comparatively speaking, there being a great many alders which will never be profitable nor ornamental trees - it would be very easy and no great expense to run a paling along the foot of the bank, and cut away the worthless trees of alder, &c. and plant and fill up with plants of ash, oak, &c. Such of the ash as will be ornamental trees may be left; a tree or two from the alders at the Burn Cottage could be taken out with advantage, and improve the others by giving them scope.

**LARGE TREES GROWING FROM THE OLD STOOL,
CHIEFLY PLANE, ASH, AND ELM.**

No. IX.

Craignekall Parks.

The few trees marked to be cut in these fields are only such as are dying or very materially injuring the others; they should be cut down with the greatest care not to injure those that are to stand, particularly those that are to be cut from the old natural root; there being three, four, and sometimes five trees growing from the same root; the tree to be taken away should be cut in a sloping manner, and the cut afterwards carefully dressed up so as not to lodge wa-

ter about the old stool to injure the trees to stand. It is worthy of observation, that the trees growing from the old stools here, notwithstanding their exposed situation; (being almost opposite the east point of the island of Jura,) are in a most healthy and thriving state, and have attained the size of from four to eight feet in girth; while those growing from the plant are not near so large nor so healthy. It is plain to a demonstration that the surest, speediest, and most effectual method of rearing timber trees to maturity in exposed, bleak, and bare situations, is from the natural stool or root. In one of these fields stand two common willows or saughs, which are really worthy of notice; these trees are only twenty-five years old, (the man is alive on the estate who planted them) and now contain fifty-eight cubical feet of timber; these trees, at 2s. per foot, their lowest price, is L.5, 16s., which is a very great increase in twenty-five years; then an acre of land, even the very poorest, if adapted for willows, will carry at least 400 of such trees, which, in twenty-five years would be worth L.1160 sterling per acre; but even allowing 200 trees on an acre, would be L.580 for every twenty years—an annual rent of from L.20 to L.30 per acre; this is not imaginary—these trees are growing in a field near Duntroon Castle, Argyleshire. I have formerly recommended the willow and poplar as a most profitable crop in damp or wet soils; indeed nothing can be more profitable in places so adapted for the purpose.

No. X.

*Island Mankaskan, the property of Neill Malcolm,
Esq.*

This island is wholly surrounded by the sea, exposed to, or rather standing in the Western Ocean, within a few miles of the great gulf of Coryvreckan, and the strait betwixt it and the main land is navigable for large vessels. It is not my design to give a description of the island, but only to show what a degree of perfection trees can be brought to, even on the most exposed situations. Here is an island, not only without shelter, but exposed to every wind and blast that blows; so much so, that sometimes in a storm, the sea spray is known to have been driven nearly over the whole of it,—still trees will not only grow, but arrive at maturity on this island. I need only call the attention of the reader to the trees at present on it as a proof of this. There are a great number of plane trees, and these too on nearly the most exposed part of the island. The girth of one of these trees, at the smallest place of the trunk, four feet from the ground, is eight feet two inches; there are many more nearly the same size. It may be proper to mention, that these have all been reared from the old stools, some of them are beginning to decay, particularly the largest one; but this is only at the root of the trunk, a little above the surface of the ground; nothing but the ravages of time has done this, for its top is as green as ever in summer. The oak, the ash, the Scotch elm, and plane are growing in great numbers through the island; were it not that it is pastured with sheep

and cattle in summer, the whole island would soon be covered with wood self-sown, as the whole wood on the island is natural. A few years ago, when I surveyed this island, I advised the wealthy proprietor to plant the whole of it, as nothing else could be more advantageous and profitable, whether for natural oak as coppice, or rearing trees to maturity; from its advantages of sea carriage, it would pay uncommonly well per acre, notwithstanding its rocks, it would soon plant itself if the cattle and sheep were taken away; it needs no enclosing. The whole island, if converted into natural oak coppice to cut every twenty-four years, would pay at the rate of L.5 per acre of yearly rental.

No. XI.

A Neglected Coppice Wood.

The coppice woods on these farms, covering an extent of some hundreds of acres, and occupying land not capable either of cropping or pasture, yet capable of growing excellent oak on almost every foot of it, would, if properly attended to, and divided into hags, say twenty-four cuttings, cutting a lot yearly, be brought to pay at the rate of L.7, 10s. sterling of annual rent every acre; it is at present in a most shameful state of neglect. The ground in almost every part of it is covered with stools or stems of oak, at not more than three feet stool from stool, and these not having been thinned since last cutting, are completely overburdened, and are evidently killing each other and dying for want of nourishment, so

that the whole is stunted in their growth, and having been allowed to stand from ten (the youngest cutting) to sixteen years old; it is plain to the most superficial observer, that if not thinned out immediately one fourth of the crop will be totally lost, and the whole rendered unproductive, and to say the least of it, not near half a crop. All coppice woods should be thinned the first year after being cut over, (*See Forester's Guide on neglected Coppice,*) besides, it may not be unworthy of notice, that, by allowing a coppice wood to remain in that state, it loses both in quantity and quality of bark, as also in usefulness of timber, and incurs more expense in manufacturing; for instance, the bark of the whole is thinner, becomes hide-bound on the tree, and requires more bating to take it off; of course there is less natural sap, so that it weighs lighter,—it is not so good in quality, and being sapless or hide-bound, requires more time and expense to take it off; and besides, none of the shoots, from their stunted state, have arrived at the size of spoke timber, and is only fit for charcoal or fire wood. It is both natural to suppose, and a truth that cannot be denied, that when a healthy tree or stool of oak is cut over, it sends out a greater profusion of shoots, and these in a very luxuriant state,—it even sends up more sap than the young shoots are able to absorb, and for the first two or three years we often see the sap running off the top of the stool or root, to waste. Now, if the saplings or young shoots are thinned out the first year after being cut, to three or not exceeding four upon the stool, these receiving all the sap after the first year, from the thinning, become so healthy and strong, that they absorb all the sap the roots send

up; and we have often seen growths of oak, Spanish chestnut, ash, and plane, in three years, twelve and fifteen feet high, and six inches in girth at the roots; it is therefore always advisable, and more profitable, to dress up the old stools properly, and rear the saplings therefrom, if fresh and wholesome, than to shift the shoot to be reared up to one of the fibres of the old roots. If there is vacant ground on any of the sides of the stool, the superabundant sap may be saved to great advantage, by laying bare some of the leading roots nearest it with an axe, and it will send up a shoot or two which will fill new ground; this should be particularly attended to in all coppice woods,* but here we are treading in a coppice of from ten to sixteen years old, and will thinning at this age do it good, either as to quality or quantity? I say it will. For example, I requested a proprietor of oak coppice woods in Shropshire, for leave to try an experiment on two neglected acres of oak coppice, at the age of fifteen years. The wood contained about thirty acres, which had been all cut in one year; with the consent of the proprietor and assistance of his land steward and forester, we selected and measured off two acres as near a-kin to each other as it was possible, and so similar in growth, &c. that not the least difference was perceivable betwixt them; a halfpenny being tossed up which was to be the acre thinned out: one of the acres was immediately thinned, leaving three, four, and not exceeding five shoots on any one stool; the thinnings were barked, although of course, (as should always be done,) the

* See Plate 2d. Figures 3d and 5th.

unthrifty and dying shoots were taken away, still there was from the thinnings, one ton two hundred weight of bark, which brought only about £.11.; the bark being not the best in quality. The two acres were allowed to grow, in this state for nine years, till the age of twenty-four years from cutting time; and it is a notorious fact, that the acre thinned out produced near a fourth part more bark than the acre not thinned, and the bark too of better quality, and the timber of the thinned acre brought near double the value of the other, as many of the shoots were fit for cot-house purposes, and not a few for spokes. This shows at once the propriety and advantage of thinning coppice woods, even although neglected to a considerable age. But it is the greatest loss, and fully imaginable to allow natural woods to come to this age before being thinned, as the growth of the whole is injured, and of course less productive; but when such has been allowed to stand too long; still by giving them a thinning, they will be found both profitable for the present crop, and advantageous for the growths in future, by having fresh healthy roots when cut over, to rear the new growths from.

No. XII.

Rearing up, unenclosed Natural Stools.

It is a notorious fact, that throughout most of the counties, comprising the Highlands of Scotland, particularly the whole of Argyleshire, that there are millions of stools or roots of oak and some other kinds of trees detached throughout

almost the whole of the extensive fields now appropriated to sheep pasture; nor is this to be wondered at, when we consider that many thousands of acres of land, that was formerly carrying natural woods, have of late years been left unenclosed and set aside for pasture lands; it is no less wonderful than true, that, the growths of these stools or roots, though devoured and eaten up in winter by cattle and sheep, are never wholly extirpated; as soon as the grass gets up so as to afford a supply of meat for the sheep, &c. the growth gets up, and so soon as the grass fails, the growths or saplings are eaten up. Now, were these dressed up from the old root of the stool and enclosed singly, many a beautiful and truly valuable timber tree could be reared; as these stools send out most rapid growths, the enclosing would only be required for two, three, or not exceeding four years, when their tops would be totally out of the reach of cattle or sheep. Sheep are always detrimental to trees; but when once the natural growths of oaks, &c. are out of their reach in the tops or lower twigs, there is no danger of their not becoming timber trees; the method of enclosing all detached stools of this kind could be most effectually done by my portable paling, (*See Forester's Guide,*) as the stobs and bolts could be easily carried from one stool to another as they are required; or wherever there are larch firs, four or six stobs of larch, and these twisted up with the small loppings of the larch, will be found to stand as long, from the first putting up, as will be necessary, and this will cost a mere trifle. For example,—there is on two or three farms in North Napdale, Argyleshire, the property of Neill Malcolm, Esq. of Portalloch, (taken from actual sur-

vey,) 40,000 unenclosed oak, and 20,000 ash stools; the whole not worth at present £300 sterling; nor will they ever be worth much in their present unprotected state; were these thinned out for standing timber trees, in such a manner as described in my *Forester's Guide*,—say take away all the radical or unthrifty shoots, and leave on them one, two, or not exceeding three of the very best, healthiest and most thriving, and those most likely to become trees, such as were pointed out, or particularly described to the forester as he went on; and on such of the stools as have comparatively no shoots from them, having been eaten up by the sheep, &c., dress such properly up for the growth before enclosing them, and a very few years after being enclosed, will put them completely out of the reach of cattle, &c. If this is properly attended to, in the way and manner shown the forester as I went along; in twenty years after, these very stools will be worth at least £50,000 sterling; in from fifty to sixty years, worth £150,000 sterling timber and bark; observe, as the old stools or roots are large, there will be three trees, on an average, reared up to maturity as timber trees from every stool; besides, these trees will still be increasing in size for two centuries to come, notwithstanding their ornament and increase in value, as timber trees. Let every unprejudiced person, the least acquainted with that country, anticipate the infinite grandeur and beauty such trees will add to the whole country, and to the prosperity of the proprietor of these farms; nor do they take one inch of ground from the farms, as by clearing away the rubbish, and confining the stools into two or three shoots from them, there will be the more grain. I suppose on these farms there

are not four trees to an acre, so that in a few years the trees will be worth much more than the proprietor paid for all the lands. It may be worthy of observation here, that the whole of these trees could be gained by about an outlay of L.50 for men thinning, dressing, and enclosing. I may also observe, that the wealthy proprietor has an immense number more on his extensive properties in that country, and has set about these and other improvements with spirit and life. I beg to add, that a great quantity of excellent timber trees could in this way be reared up for the British navy.—None that ever travelled from the head of Glenshira to the farthest part of Kintyre, or from Inverary to Campbelltown, without going one inch off his road, but must have seen thousands of such stools, and if such a quantity of timber can be reared, and a vast sum of money realized from a few stools, thereby yielding so great a profit to one individual; what would be gained to numbers by attending to it on the same extent, and this is but a small portion to what I could mention, and all this, I had almost said, within a rope's length of where vessels could take the timber of them on board?

I have often been surprised at the supineness of many of the proprietors in this part of the country, especially those who, almost a nod from them, so to speak, could rear up such properties to themselves and their posterity,—ornamental to their estates, and embellishments to the whole country, and my surprise is the more, having had the honour to be on many of their lands, and above all things, with my tongue and my pen, impressed on them this easy and profitable improvement. I hope and trust this volume will help to awaken them from the strange lethargy in which

they have been enveloped for so long a time. The wealthy proprietor, whose farms have just been mentioned, has an extent of land little short of forty miles, from Eriden Lochaw to Castle Sween, and were that gentleman to offer me a choice of the woods on the wood-lands, or the rental of these farms for seventy-two years, with liberty to take in the unenclosed stools of wood on these farms, I would take the woods, and by this means I would insure to my posterity, at the end of seventy-two years, a sum of at least £.500,000 sterling, from timber trees on these lands; and have annually a good living from the three sap-pice cuttings, nor would this take one acre of land off these farms, nor one shilling of the present rental. But this gentleman has already begun to appreciate the value of improving his woods, by establishing such a system, and putting the operative management of that system into the hands of a forester, whose skill, and indefatigable activity in planting and rearing woods and plantations, will, in a very few years, be an immense revenue to his posterity. Since the first edition of this Miscellany was published, I have had occasion to be in the shires of Dumfries, Roxburgh, Berwick, and Northumberland, and there is a very great many of such stools, of various kinds of wood, which, if attended to in the manner described, would be of immense value, in a very few years, to the proprietors.

No. XIII.

The following from the pen of the late Lord Meadowbank, in his interesting and judicious instructions to foresters, which coincides so much with what

published in the Forster's Guide, on the necessity of rearing underwood in belts, and the injurious plan of pruning firs, will not be uninteresting to my readers, and no doubt this, as well as some other extracts from it, would have appeared in that work, had it happened to fall into my hands before I published it; but I regret that I only saw it a short time ago:—

His lordship says, "At first one is astonished that in the cultivation of parks, or of addition to parks of the most considerable proprietors, and of persons whose rank and consequence lead to expect that they have the best information of the damage which threaten sometimes to be irreparable, is often inflicted in the rearing of the young timber: The park of Duddingstone, near Edinburgh, has belts of oak and other trees, which should rise to the first magnitude; from the breadth of the belts, the warmth of the climate, and the great depth and richness of the soil; but these belts have seemingly, with great care, been kept cleaned, not only of all underwood, but the lateral branches of the trunks have been cut off, and the winds in summer and winter pass through them without impediment in all directions. Hence, trees that, if tolerably treated, ought to have risen to the height of from 80 to 120 feet, and should have already 60 to 70 feet, will, in all probability, never attain to half the size that they should have attained. Had the lateral branches been left for a time with due subordination in size and position upon the trunks, the sap would have been invited by their loving principles, to ascend to the summits of the trees;—their temperature would have been preserved as warm as the climate admitted of; and the wood below being also darken-

ed by underwood, originating seeds sown by the birds, would have become lank and harmless to the growth of the trees; and in this way too they would have acquired the outline and aspect of natural woods, and by a judicious pruning of their tops, would have grown speedily and freely in their youth, while in their age they attained the greatest dimensions that the soil and climate in which they were planted admitted. It is quite remarkable, however, consequence of an abundant supply of underwood along the north belt of Lord Morton's park, at Dalmahoy, from Burnwynd, eastward to Addinton, the trees that suit the soil are evidently already assumed of attaining the first magnitude, though planted only about the same time with Duddingstone belts, and certainly not favoured by superior advantages of soil or climate. One would still however cherish a hope, that in consequence of the natural longevity of the oak, and the proportional duration of healthful roots and youthful vigour that belong to it, underwood and especially evergreens, such as silver firs, hollies, and lauro-cerasus, might still be successfully employed to renew the vigour of such plantations; care being always taken to remove trees of inferior sort when they appear to encroach upon the oaks, and discourage their growth. But unfortunately such mistakes are not confined to Duddingstone, where the absence of the noble proprietor may account for the maltreatment of the park; for one often sees similar mistakes elsewhere committed, and underwood and lateral branches carefully cleared away from plantations, and even from belts, under the notion that it robs the trees of the larger proportion of nourishment they would otherwise receive. Na-

thing, however, is more certain, than that the under-wood favours the growth of forests.

In a way not more excusable, one sees in travelling to Melrose by Middleton and Bankhouse, the lateral branches of Scotch firs, still in extreme youth, carefully amputated, and even larches, which so indispensably require the balancing power of their branches, though rearing in sheltered situations, treated mercilessly in the same manner, and deciduous trees too; a few branches at the top being alone saved, except now and then some trifling twigs on the sides of the beech or oak, which seem to have been deemed too insignificant to obtain notice.

It is perfectly obvious to any person in the slightest degree acquainted with the cultivation of trees, that depriving larch and Scotch firs of their lateral branches, renders the roots that formerly nourished them, comparatively useless. These no longer transmit the same abundance of sap upwards to be prepared by the lateral branches; and, of course, being comparatively useless, the roots become proportionally inert, and the stem acquires little or no additional volume except from the action of the uppermost tiers in preparing the sap, which, however, will no doubt in time, though slowly, contribute to give it somewhat of a columnar instead of a pyramidal form. But let it be considered what miserable dwarfs such trees must become, even with all the advantage that the lofty sloping banks of that district, and masses of the plantations there may continue to afford. The trees will no doubt be less agitated than in exposed situations; but they are deprived mainly of the principal means afforded by nature for pre-

pelling their tops and increasing their elevation and volume. The top and lateral branches form the great instrument for this object; the tip of every branch seems to attract the sap to it upwards, in proportion to its tendency to elevation, though it may be preternaturally favoured for a little by the crowding of the trees, cannot ultimately proceed with that certainty, uniformity, and advantage of general growth which confining on the plant its due proportions of breadth and stomach, would enable it to reach. In fact, the proceeding here censured seems to be as absurd as to attempt raising abundant crops of potatoes by depriving the plants of their branches, save the central stems; or feeding an ox by means of taking measures for diminishing the capacity of his stomach, or the membranes of his lungs, when the juices furnished by the stomach are exposed under due precautions to the action of the different brutes, under the excitement of a particular temperature.

I have been in company with some English proprietors of woods who argued, that Scotch firs will not thrive and grow to any size, nor become good timber; this, however, shows that all such have never seen the Highlands of Scotland. There is on the hill of Dunsquh, and on some of the hills of Glenashira, and Glenaira, estate of Inverary, the property of his Grace the Duke of Argyll, Scotch firs of the greatest magnitude, and exposed to the storm from all quarters, growing many hundreds of feet above the level of the sea; many of these trees have from 45 to 60 feet of a trunk and contain 100 solid feet of timber, equal to the best Mensel timber; these are

also fine large Scotch firs in many places of Inverness and Ross-shires, on high exposed situations.

There is on the estate of Polymore Park, Ireland, the beautiful seat of Earl Roden, according to a valuation made in 1826, nearly £100,000 worth of growing wood, and with the exception of a very few trees, the whole do not exceed sixty years growth; while the ground these trees occupy could hardly be turned, with advantage, to any other purpose; many of the larch firs on that estate have been cut away as thinning, to improve those to remain, and have brought in and upwards; several clusters of these firs contain upwards of 1000 trees on an acre, and at an average value, will sell for £8 per tree; some silver firs planted at the same time, now contain 140 solid feet, and worth £10 per tree; many of these trees grow in a very elevated and exposed situation.

The noble proprietor is still going on enclosing and planting, and has, within these two years, most judiciously planted upwards of 300 acres of the waste lands on his estate. The profits his lordship is deriving from his plantations, though only cutting for improvement, hold out the most cheering prospects, and should bestir other proprietors to go and do likewise.

It is astonishing that proprietors should be so backward to their own interests, by not taking greater care of the plantations already on their estates, and planting more of their waste lands, when to a certainty they hold out such inducements to profit. So attentive were our ancestors to insure a proper supply of timber, that the proprietors of woods were compelled by the statute of the 51st of Henry the VIII. to leave twelve of the best standrills on every

acre of coppice, at each fall; together with a due proportion of younger branches for succession; and were at the same time restricted from cutting any of the former, till they should measure forty inches in circumference, at five feet from the ground.

In many parts in the Highlands of Scotland, and particularly in Ireland, woods suffer much by the hands of the pilferer, particularly so in all places where coals are high in price, and other kinds of fuel scarce; in many places great mischief is done by wantonness to young plantations; and wherever this is the case, it really should be punished to the utmost. The following Acts of Parliament, so far back as 1685, which may not be generally known, well deserves a place here, as it shows very strongly the regard our ancestors had for the protecting and rearing of woods, &c.

Copy of Acts of Parliament regarding the destroying of Trees.

Act of Parliament, 1685, cap. 39, it is *inter alia*, statuted and ordained, "That no person shall cut, break or pull up any tree, or peel the bark off any tree, under the penalty of ten pounds Scots, (16s. 8d.) for each tree within ten years old, and twenty pounds Scots, (£1. 13s. 4d.) for every tree above that age. The buyers and users of the timber of any tree so cut, broken, or pulled up, are declared liable to the same penalty, unless they can produce the person from whom they got it. And if the person convicted be not able to pay the fine, he is decreed to work a day for each half mark contained in the fine, to the heritor whose plantation has been cut down or broken."

The same act ordains; "That no persons break down or fill up any ditch, hedge, or dyke, by which ground is enclosed, or leap, or suffer their horse, colt or sheep, to go over any ditch, hedge, or dyke, under the penalty of ten pounds Scots, *toties quoties*, whereof half to the heritor, and the other half for mending and repairing bridges and highways within the parish, at the sight of the sheriff, steward, or justice of the peace, before whom the contraveners shall be pursued."

The act 1698, cap. 16, ordains, "That tenants and cottars, (cottagers) preserve growing wood and planting upon the ground they possess; and that none of it be cut, broken, or pulled up by the roots, or the bark peeled, under the penalty of L.10 Scots, for each tree under ten years old, and L.20 Scots, for each tree above that age, to be exacted by the masters alienarly."

By statute 1st Geo. I. sess. 2, c. 18; it is enacted, "That if any one shall mischievously break down, cut up, bark, destroy, or spoil any timber tree, fruit tree, or other tree, the person damaged shall receive satisfaction and recompence from the inhabitants of the parish, town, hamlet, villa, or place, to be recovered by way of summary action for damages, as in other cases of riots; unless the party offending shall be convicted by such parish, &c. within six months. Upon complaint made by the parish, hamlet, villa, or place, or by the owner of the trees, or by any other, to two or more justices of the peace, the offender is, when convicted, to suffer imprisonment, and whipping; and is not to be discharged till he find securities for his good behaviour for two years." And by the same act, "If any person ma-

liciously set on fire, burn, or cause to be burned, any wood, underwood, or coppice, he is to suffer as a wilful fire-raiser."

No. XIV.

Great Chestnut Tree on Mount Etna.

[A friend having sent me a drawing of the Great Spanish Chestnut Tree upon Mount Etna, with a description of it, which I here subjoin as a treat to every lover of trees, and the more readily, as in the sequel it will be seen, that I not unfrequently recommend the propagation of the Spanish chestnut, both as a profitable and ornamental tree.]

The Spanish or sweet chesnut always grows to an immense size in every country. The largest in the known world is that which grows upon Mount Etna, in Sicily. "This celebrated tree exceeds the size of other trees so much, that it cannot fail to excite the greatest admiration. It has its name from the following circumstance:—Jean of Arragon spent some time in Sicily on her way from Spain to Naples. While here, she visited Mount Etna, attended by her principal nobility, and happening to be overtaken by a storm, they took shelter under this tree, whose branches were sufficiently extensive to cover them all.

"A celebrated traveller reports this tree to be one hundred and sixty feet in circumference, but quite hollow within, which however affects not its verdure; for the chesnut tree, like the willow, depends upon its bark for subsistence, and by age loses its internal part. As the cavity of this enormous mass is very considerable, the people have built a house in it, where they have an oven for drying nuts, almonds,

chestnuts, &c. of which they make conserves. They frequently supply themselves with wood from the tree which encircles their house, so that it seems likely in a short time to go to ruin through the ingratitude and thoughtlessness of its inhabitants. Besides this there are abundance of other trees of the same species in the neighbourhood very remarkable for their size, all very beautiful and straight, and almost as smooth as polished marble; one of them measured thirty-eight feet in circumference, and there were numbers of others nearly of the same size. Among these there were seven standing together, which have received the name of the seven brethren; another is designated the ship, from the general figure of its top, which has some slight resemblance to a ship. Its diameter is twenty-five feet, so that the circumference cannot be less than seventy-five feet."

That the Spanish chestnut will thrive well in all parts of this country there is no doubt, if properly cultivated. There was standing a few years ago at Fortworth, in Gloucestershire, a chestnut tree fifty-two feet round, and it is proved to have stood there ever since the year 1150, and was then so remarkable, that it was called the great chestnut of Fortworth. It fixes the boundary of the manor, and is probably one thousand years old.

There are seventeen trees of Spanish chestnut in the lawn called Wintertown, near the Castle of Inverary, the seat of his Grace the Duke of Argyle. The average solid feet in each tree 155; some of them girths upwards of 20 feet a little above the ground. In the old garden wood, near the castle, are forty-five trees averaging nearly 100 feet each; these trees, before some of them began to fall into decay, were worth

upwards of £2000 sterling; many of them are tall magnificent trees, nothing can excel them in beauty. The chesnut, as an ornamental tree, is excelled by none and equalled by few, and it has a degree of greatness belonging to it, which strongly recommends it to the forester's attention; its properties as timber have been pointed out and recommended elsewhere in this book. I may here add, that its timber is universally allowed to be excellent for liquor casks, not being liable to shrink, nor to change the colour of the liquor it contains. Its fruit too is valuable, not only for swine and deer, but as human food; bread is said to have been made of it and found very wholesome; upon the whole, the Spanish chesnut, whether in the light of ornament or use, is most undoubtedly an object of great admiration.

There is a chesnut on the estate of Gask, Perthshire, which girths twelve feet in the trunk, the branches of which spread to a great extent, covering no less than three hundred feet in circumference, of course a most magnificent tree. See the prolific Spanish chesnut on the estate of Riccarton, elsewhere described in this work.

No. XV.

Cnochgamgoach; or, Alexander M'Donald's Camp.

[Stroneskar, on the estate of Neill Malcolm, Esq. of Poltalloch, near Lochaw, Argyleshire.]

The beautiful old Scotch firs on this artificial knoll are of an excellent quality, and are still healthy and thriving, although assailed by boisterous winds, unprotected and unsheltered in all directions; all pos-

sible care should be taken of these venerable trees to preserve them from external injury ; as from their detached and elevated situation, they are a great ornament to the whole of this part of the country, and it is probable, were growing on this fairy knoll when this part of Scotland was over-run and plundered by the Irish warrior, Alexander M'Donald, commonly called Sandy M'Donald, about two centuries ago, when they would be mute witnesses of his rueful countenance when informed of the name of this knoll ; his nurse, who was possessed of the gift of prophecy, or prying into futurity, told him that all his adventures would prosper with him till he stood on Cnochgamgoach, when the scales would be turned against him, and in all his future adventures he would be worsted, which, as history informs us, turned out to be the case. There are other old trees on this farm, which, in this part of the country are a great beauty ; these venerable productions of nature speak more than volumes, to what a degree of maturity and perfection, these noble works of nature can be brought to in this part of the country ; nothing but the ravages of time, that great leveller, and I may add, the lapse of two centuries, has brought some of those stately trees to show symptoms of decay ; a person must be filled with delight and wonder on seeing trees unprotected and uncared for, towering to the clouds in magnificent grandeur, and bidding defiance to the storms and tempests which has, during these two hundred years past, shaken to their foundations the strongest castles built by human art and ingenuity, and laid many of them in ruins ;* when clad in their summer

* It is a well known fact that there are a great many old castles, once very strong places of defence and safety in this part of the country, now in ruins.



GREAT CHESNUT TREE ON MOUNT ETNA.

Engraved for Monteforte's Miscellaneous Reports of Woods & Plantations &c. &c.



robes, they look down on all the boasted pride of man, and verify, that "Solomon in all his glory was not arrayed like one of these." He must be void of feeling and hard-hearted indeed, that would not be sorry to see these noble productions of nature that has bid defiance to the ravages of centuries, yet returning to their original nothing, especially when he calls up a single reflection on his own momentary existence.

No. XVI.

Explanation of the Plates.

Plate I.—The Great Chesnut Tree on Mount Etna. See No. XIV. page 81.

Plate II. Fig. 1.—This is intended to represent a pollard tree, which is an excellent method of thinning out groves of old full grown trees, where ornament and screen is absolutely necessary to be kept up. See No. IV. p. 52. It may be only necessary here to remark, that this is also an excellent method when trees of a large size are to be transplanted into exposed situations, to pollard them one or two years before removing them, and allowing the scions to make some progress in growth after the top has been amputated, in the same manner as preparing the roots in transplanting old trees. (*See Forester's Guide.*) It may be also necessary to remark, that if the trunk of the tree is solid where cut over, it should always be dressed up to a point in the centre to make the wet run freely off it, and also to prevent any dust or rubbish from lying on or getting in betwixt the bark and the trunk so



robes, they look down on all the boasted pride of man, and verify, that "Solomon in all his glory was not arrayed like one of these." He must be void of feeling and hard-hearted indeed, that would not be sorry to see these noble productions of nature that has bid defiance to the ravages of centuries, yet returning to their original nothing, especially when he calls up a single reflection on his own momentary existence.

No. XVI.

Explanation of the Plates.

Plate I.—The Great Chesnut Tree on Mount Etna. See No. XIV. page 81.

Plate II. Fig. 1.—This is intended to represent a pollard tree, which is an excellent method of thinning out groves of old full grown trees, where ornament and screen is absolutely necessary to be kept up. See No. IV. p. 52. It may be only necessary here to remark, that this is also an excellent method when trees of a large size are to be transplanted into exposed situations, to pollard them one or two years before removing them, and allowing the sprouts to make some progress in growth after the top has been amputated, in the same manner as preparing the roots in transplanting old trees. (See *Forester's Guide*.) It may be also necessary to remark, that if the trunk of the tree is to be cut over, it should always be dressed up to a point in the centre to make the water run freely off and also to prevent any dust or rubbish from being on or getting in between the bark and the trunk.

as to injure it; this should be carefully attended to when healthy trees are pollarded. When it is old decaying trees. See No. V. p. 56.

Plate II. Fig. 2.—This is intended for a representation of the converting of natural growths or stools into standing timber trees; see this method also fully explained in *Forester's Guide*. Beautiful growths of this description are to be seen in many places; but it must have struck every person with delight on passing those on the public road near Stirling, to Dunbarton, and betwixt Thornhill and Dumfries. See the propriety and profits of this method, No. XII. p. 69.

Plate II. Fig. 3.—Represents a coppice stool having been properly cut and thinned out in time; the shoots to the left shows them occupying new ground; from roots laid open, rearing from the old stool. See No. XI. p. 66.

Fig. 4.—Represents a tree cut high above the surface of the ground, so that the shoots or wafers never come to be of any value either as to wood or bark, and are always loose and apt to be broken off by snow or otherwise.

Fig. 5.—Represents something of the same kind, which method of cutting should always be guarded against, as it is never productive. See this fully explained in *the Forester's Guide*.

Plate II. Fig. 6.—This is a representation of a tree growing by way of miracle, from an old stool, never having been enclosed or cared for; yet had grown up both to be useful timber and beautiful; but see the contrast in point of value, betwixt this and Fig. 2. which had been enclosed. See No. XII. p. 69.

Plate III.—Spanish chesnut at Riccarton. See title page, and an account of the tree elsewhere.

No. XVII.

It will be seen in Plantation, No. XLV. (Deer Park,) that I recommend having roads or rides through woods, as no small acquisition, and this is particularly the case when in the neighbourhood of a mansion, being equally a refuge from the heat in summer and the cold of winter. Where these are in dens, &c. where there are rivulets of water, with bridges crossing for the private walks of a family, where there is only heard the humming of birds and sounding of the rivulet, it must be enchantingly beautiful. Besides, such roads make the woods of easy access for the proprietor, and brings him acquainted with what his woods contain. To persons of opulence, who are proud of such property, roads of this description tastefully laid out must be particularly gratifying; all such roads should curve so far, that the wind cannot traverse any great length through them; an additional advantage which such roads and bridges afford, where necessary, is the facility of transporting the timber, bark, &c.

In all places requiring bridges, I beg to call the attention of my readers to those made of iron, either for foot walks or carriage ways, being cheap, durable, and ornamental. The most modern, cheapest, and best made iron ones I have seen, are those erected by Mr. John Justice of Dundee; a short description of them may not be uninteresting to many of my readers, and of some importance to such as may be intending to erect any similar. The suspension bridges, designed and executed by Mr. Justice, differ from others, owing to the ingenious way they are

constructed; in my opinion, more strength is also produced from less iron than in any that I previously knew of. I have recently seen one erected by him in 1823, for Colonel Chalmers, at Glenelich, the country seat of that gentleman. The span of which is 104 feet, the road 10 feet wide, with a carriage way in the middle, and a narrow footpath on each side. This bridge is capable of bearing any weight that can be put on it; indeed, the first trial was seven loaded carts, each drawn by one horse, so as they could be all on it together.

This bridge is supported by two strong chains under the roadway, each of them proved, before putting up, to carry a strain of 25 tons; but the principal strength lies in twenty-eight suspension rods, each of them was also proved, before being put up, to carry 20 tons; so that the strength is superior in a tenfold degree to any weight that can go on it.

Notwithstanding the great strength produced, owing to the way it is constructed, there are only 2 tons of fine iron in the suspension rods, bottom chains, back stays, and every thing else in any way suspending or bearing the strain of that ponderous weight; and about 3 tons more of common English Iron, applied, in main posts, at the ends, (to save mason work,) and the cross beams or joists for supporting the road-way, and other parts where tenacity is not required.

All parts of this bridge contribute jointly to the general strength, as well as severally to that of their respective places; and any part, except the main posts, may be taken away at pleasure without weakening the general structure, more than the mere use of that part taken away; which must be of great use in case

of repairs being required in the lapse of time, and I believe the expense was not one-third of what a stone bridge would have cost, although plenty of stone is to be found on the spot.

Besides bridges for carriages, Mr. Justice has erected a number of foot bridges, some of which are upwards of sixty feet span, and which did not cost more than L.40, including mason work; and these not only carry as many people as can go on them at once, but as many horses. Bridges of the same span, for carriages, will cost L.80 more, independent of mason work. These bridges are adapted to every situation, but some situations will cost much less than others.

I may also observe, that in wooded dens and ravines, where there is rock on both sides, which is often the case, these bridges could be erected at an expense of little more than twenty shillings for mason work, and put up by an ordinary mechanic, as they are all put together and proven at the factory.

No. XVIII.

The following plantations, though the names of the estate, or particular spot where they grow, is not given, yet they are so particularly described, and the method of planting, draining, thinning, pruning, and rearing, is so minutely entered into, that no forester or rearer of woods will be at any loss at once to discover a proper method of recovery and improvement for every corresponding wood or plantation under their management, on any estate in Great Britain or Ireland.

This long bank of wood is really in a miserable state of neglect. There are, for about three or four perches-length, from the east end ascending the bank, where there are some very good trees, chiefly ash, but on proceeding above that, there is little else but trash or natural stool of alders, a few ash and beech, and particularly, a little before arriving at the bridge that crosses the river and onwards to the top, there are hardly any thing but trash of that kind. Here we come into a very marshy place for a good way, which should, and could be very easily drained, by cutting open drains through it. As this is a most excellent bank for a natural oak wood, which is both very profitable and ornamental in a place of this kind, while in its present state it will not pay, or even come to be useful to the estate in any sense, if allowed to remain as it is; indeed, it is still getting worse by the trash killing what might have come to be good trees; besides, it is just so much lost land to the property. The method to be followed here, and to recover this almost lost place, is to go carefully over the whole, beginning at the east end, marking all the healthy and thriving trees of oak, ash, and elm, or other hard wood trees that there is any hope of rearing to maturity as timber trees; and here I would also recommend a selection to be made from amongst the natural stools of ash, &c. although these may not come to maturity as timber trees, yet they may stand a few years, to keep up the look of it as a wood, till others come up; marking all such trees with paint, and then cut

over the whole of the others, clearing the bank of brushwood, &c. and plant the whole ground with oak, at eight feet, plant from plant, convert the whole into a natural bank of oak coppice, which will not only be the most profitable, but also most ornamental when turned into this purpose, and will pay an annual rental of at least L.7, 10s. per acre for ages to come, and that without any expense whatever of keeping it up—it is already well enclosed. Keeping always the thrifty trees of old timber standing, or maidens as they are generally termed, amongst the coppice, which will keep up its look as a plantation of standing timber trees; the coppice will not only be beautiful, always healthy and thriving, but will also afford excellent shelter for game, say pheasants, &c. and being so near the mansion, this is a consideration of consequence. This should be set about immediately with spirit. The alder, and other wood to be taken out, will do much more than pay the expense; as they will bring in a great deal of money, in cutting up into barrel staves.—Let it be understood, that by cutting up the staves, a great deal more money will be realized from the cuttings than otherwise. There is a small clump of spruce and other firs at the top of this bank, below ———'s cottage, very thriving, which clearly shows what fine wood could be reared here. The row of old trees along the top should all be reserved till the coppice, &c. come up. A circular saw, to go by water or otherwise, could be put on a threshing machine for about twelve pounds, which would be extremely useful for cutting up the staves, as also fire-wood for the house.

THE END OF THE FIRST VOLUME OF THE HISTORY OF THE

use, and will do it at the sixth part of the expense of common labour.

No. XIX.

Field.

The row of trees at the top, and otherwise round this field, as also the row of old trees running up the centre of the field, should be allowed to stand, as when viewed at a distance, from their elevated situation, they are very ornamental; there are a very few dwarfish trees in the row along the top, that never can get up, which may be taken away with propriety; but these will not exceed five or six in number, as the more that stands the better it looks while they continue green. All trees in single rows round enclosures should be thinned out to proper distances when young, because when allowed to press upon each other till they are old, they for the most part get bad tops, and never are good looking trees; when necessity makes it necessary to take some away, those left have always bad tops on the side where the other tree whipped it, and ten to one if ever it will recover branches to become a proper tree. I grant, that trees in single rows, having two open sides to extend their branches on, will do closer than those in plantations that are pressed on all sides; still all single rows should be thinned out to proper distances before they be twelve feet in height, and all the branches left on them to make them as ornamental as possible. Trees for this purpose should not stand closer than fifteen feet, tree from tree, even in single rows.

No. XX.

Wood.

This wood has got a good thinning, and the stools of the ash being well dressed up, they are for the most part sending out most vigorous and strong shoots from the old stools, and in a few years a great many better trees from the old stools will be reared up, than the old ones; the wood is now well enclosed. But it is like locking the stable door after the horse is stolen; the sheep and cattle having got in before, have injured a great many of the young growths, they will however come on, being now protected. A good many of the dwarfish ash trees may yet be cut over and allowed to stool, as some of them in their present state never will be trees. This should be done with a good many, indeed with all that are not likely to be proper trees otherwise; where wet, drain, plant up the blanks with oaks, and fill the whole ground up with underwood, as shelter for game, &c.

No. XXI.

Wood.

This wood has been skilfully and most effectually drained; which is the life of the standing trees, of the plants already in, as it will be of those to be put in; a few of the scraggy ash trees and of the alders, may still be taken out, rear up from their stools, particu-

larly the ash, which will make much more ornamental and better trees in quality of timber here ; fill up with plants of oak, beech and elm ; rear all the new growths, even of hazel, &c. for underwood, with which it should be always covered, as it will cover over the drains, and give a much more agreeable look to the surface of the wood. This part of the plantations will very soon show the excellent effects of draining, will now carry fine timber trees, of almost every description. I would say to the forester, go and do likewise to all the other marshy wet places. I have known many old trees, even apparently dead, when the ground was allowed to lie wet, recovered by judicious surface draining.

No. XXII.

—————'s Glen.

“ Nothing exaggerate, extenuate, or set down aught in malice.”

This bank of old wood on the left, going up, requires filling up, which should be done with plants of oak, Spanish chesnut, plane, and elm. Where very wet, surface drain—where damp and cannot be got perfectly drained, plant willow tree and poplar, a few spruce firs may also be put in the bank. On the right, going up, is a bank of very fine young trees, chiefly oak, which, in my opinion is very properly done, it is thriving, and if attended to as it ought, it will soon be a very fine bank of valuable timber trees. Observe the method of thinning as laid down in plantation No. IV. There is a fine single row of old trees,

chiefly beech, between Meadow Park and this glen, which is very ornamental, and should always be kept up to two or not exceeding three oaks, completely level-topped, near the south end in the hollow, which may be taken away without any injury to the remaining trees, or to their look, nor could they do harm but good, nothing more should ever be taken out of it. There are two very fine oaks on the new line of road which stand singly, and I was truly sorry to see their roots so cut up, as I think it would be a great pity, besides an injury to the look of the place, particularly in driving up the new road, if they were allowed to fall down, it would be well to lay the earth again, forming a circuit to their roots; cause the road sweep round them if possible, to keep them alive and standing. Crossing the rivulet of water, above the bridge, the whole ground, which is excellent for rearing planting, is covered with trash of alder, which should be wholly cut over, the ground drained by open cuts, and planted with ash, oak, elm, plane, beech, spruce, and silver firs.

Passing towards the top of the glen, there is a plantation of fine young trees. Again, I am under the painful necessity of reprimanding the system of pruning which has been practised here, the most ruinous that could be possibly carried on, and it is fully a century and a half since such a plan has been known or in existence. Here are to be seen the most healthy and thriving young trees that could be imagined or seen any where; indeed they have been coming up, most vigorous, perfect models of beauty as trees, till the murdering hand of the pruner has disfigured a great many, I may say almost every one of

them, in such a shocking and shameful manner, that such a display of careless ignorance never did before come under my inspection in all the course of my profession. In taking a back look of the part of this glen we have just now left, we may say that the forester, like the insatiable tyrant death, has surely begun at the wrong end of his work; by passing over decrepid and worn out trees, already falling down with old age, and nipping infancy in its bud, and youth in all its blooming and vigorous beauty. Here are to be seen trees stripped naked of all their branches on the one side, and that too from the root to the very top—even the principal top shoots, in a great many cases, are not spared, which has so disfigured a great many fine trees, that they never will be proper ornamental trees. The whole of this plantation should be immediately gone over, and carefully thinned out to the distance of about ten feet, tree from tree, or as near as can be. In the thinning, the greatest skill and caution is necessary, being particularly careful to spare the oak, Scotch elm, Spanish chesnut, plane, and spruce firs, so as to rear as many of them alternately at the distance as can be saved. In six or eight years after, this whole bank should be again gone over, and thinned out to about twenty feet, or as near as can be, at which distance they may be then reared up to maturity, as a standing bank of ornamental timber trees. Taking care, as aforesaid, to spare always the healthiest and most likely to be the longest lived and most ornamental trees. The whole ground should be kept close covered with underwood, which can be easily done by dressing up for growth, the stools of the oak, Spanish chesnut, elms, planes, and ash to be reared from the stools. Where

there is a choice, take away the tree that has been most disfigured in pruning. I must observe, that in all places of this kind, where the soil is rich and good for rearing trees, they should never be planted so thick as they have been here; because when allowed to stand too long in such a thick state, they not only injure each other by getting bad tops, but the roots are also injured, as a mortification of the roots oftentimes takes place, and sometimes kills the whole, or stints them in the growth so as to make the whole unthrifty and delicate looking trees. Another injury done by too thick planting in good soil when not thinned out very early is, the ground gets so loose about the roots that they shake with the wind, so as not only to be easily blown down, but the whole trees are deprived of proper nourishment; such is the case with this plantation, as a person may put his hand to the tree in many places and push it over by the root; hence many of the spruce firs, although not above the height of twelve feet, have been blown down. The trees here have been put in, at a distance of only three and four feet when planted. Observe that in planting all such soils, the plants, say the kinds of trees to be reared up to maturity, should always be planted at regular distances, say ten feet, plant from plant, then it is no expense nor difficulty to thin them out regularly; but in much exposed places a nurse tree may be put in betwixt each, which should be early taken away; by attending to this method of planting, it will be very easy to leave it in the power of any one, without much expense or stretch of ingenuity, to raise up plantations to maturity as timber-trees, whether for profit or for ornament. I have been the more

particular here, as it is the first plantation of the kind on the estate that has come under my eye, and should any more similar plantations occur, I will only give reference to the system here laid down. I may further observe, that the rearing up of young plantations on a nobleman or gentleman's property is of far greater importance than many, even proprietors themselves, are apt to imagine, and the situation of a forester on an estate such as this, is one of the very first and greatest responsibility, and only men of ability, of enterprise, and of genius, should be entrusted with the management of planting and rearing woods as foresters. If a forester has any regard at all for his own character, he will duly consider that he is not only working for his present proprietor, and his posterity, but for his king and for his country, always remembering that the sea-girt islands of Great Britain are deeply interested in the operation of rearing plantations of timber trees for navy purposes—what is the office of a landed proprietor's factor or agent, what is the office of a land steward, what is the office of a gardener, what is the office of any servant about a nobleman's establishment when compared with his? If I durst hazard the remark, I would say the forester that has extensive tracts of plantation to make and rear, and who does it judiciously, it may be said of him in some future day, laying his employer's interest aside for one moment, that he has done more for the interest of the nation in preparing materials for her wooden walls, than the bee-headed statesman, who not only keeps the national house to which he belongs in a buz—

But puts Whigs and Tories in each others ears,
And make them agree like wasps and bees.

To observe once for all, the forester, before beginning to thin or prune this or any other plantation; should earnestly pause and hold a consultation, not only with his employers, but within his own breast; deliberately asking himself for what future purpose or design is the plantation intended. Is it for cop-pice, say solely for profit, or to rear up trees to maturity, that will in the end bring the most money to the estate—or is it to rear trees to stand to perfection for generations, as ornamental on the estate; and according to the different propositions fixed on, his conduct in planting, pruning, and thinning should be regulated.

I beg leave here to state, that whenever the situation for a plantation is fixed on, the future purpose it is intended to serve on the estate should always be determined on and planted accordingly, and a fixed data laid down for its future government; without which, the planter, but particularly the forester or rearer up of the plantation, is like a pilot on board a ship, in the midst of the ocean, without either compass or helm. The want of this fixed rule, with a strict attention to the plants to suit situation and soil, has been the ruin of many a plantation, and the waste of much money to a proprietor who plants either with a view for ornament, screen, shelter, or profit, not to mention the great loss or waste of time in a proprietor's getting his plantation to become a wood scenery, or to serve the purpose for which he intended them, which not being like any other crop, sown in spring and reaped in autumn, may not be in his lifetime; of course, it not only is a great

waste of money, but is a great disappointment ; besides the want of a strict attention to this one thing, nine plantations out of ten misgive altogether ; hence, the general hue and cry against planting, as say they, we will never see them either ornamental or profitable ; whereas, by a due attention to the aforesaid, a very few years will give a proprietor both ornamental and profitable plantations. See this explained at large in my Forester's Guide, and Profitable Planter, second edition.

No. XXIII.

Field.

The row of old trees in this field should be allowed to stand ; not one tree taken out, as it has a very commanding and beautiful look at a distance, as has also the strip at the head of the field ; it affords shelter to the adjoining fields, as well as ornamental to the place—being planted and formed at first on too narrow a principle, nothing can with safety or propriety be taken out of it. Strips and belts of planting made of this kind for shelter and ornament, should never be less than one hundred feet broad, and always attended to in the thinning out as early as possible, say when the trees are at a height of eighteen or twenty feet ; they should be thinned out at equal distances of twenty-five feet, tree from tree, or if in very exposed places, to twenty feet, at which they may stand as a finished strip or belt of planting, taking special care to have them standing in a triangular form, facing the wind. Observe, the thinning

must be done gradually, from the trees having been six feet high.

No. XXIV.

———'s Grove.

In this grove there is a number of fine trees, which have arrived at a considerable degree of perfection, notwithstanding their having been altogether neglected in the rearing. Let it be carefully observed and always kept in view, that all plantations, whether in large or small clusters, should be regularly and gradually thinned out. Here the soil is very rich, but the situation much exposed, so that it is altogether impossible to thin a single tree out of it with safety. In all places of this kind, when trees are taken out, they should be grubbed out by the roots. Nothing can be more disgusting to strangers, or to the proprietor himself, when walking through his fine lawn, to see the old roots of trees cut so high above the surface, strangers would be ready to draw a hasty conclusion, and say, surely these trees, particularly where a blank is perceivable, have been cut out to make a little money, or for some such necessitous purpose; it would add much to bettering the look of this and some other places in a similar state, were these old roots taken out. The blemishes in the healthy trees should be carefully dressed up as formerly recommended, and the whole allowed to stand without any cutting, unless where a tree becomes perfectly dead, which should always be taken out

before the timber of it be useless. All the blanks should be filled up amongst these trees ; this should be done with oak, Spanish chesnut, Scotch fir, elm, plane, spruce, and silver firs ; these, when put in, must be enclosed singly, to protect them from the cattle. It would be advisable to put these in plentifully, so as a choice of proper trees may be obtained to rear for ornament, as also to supply the place of those dying out or blown down, and to keep a proper crop of fine trees always on the ground.

No. XXV.

Pasture Land.

There is a young clump of planting near the head of this field which would be very ornamental, and has been at first well chosen and laid out as such, but it has been allowed of late to fall sadly into decay ; the fences are all broke down and sheep admitted ; nothing could be more destructive ; the fences should be immediately made good, and the blanks filled up with spruce firs, oak, and Spanish chesnut. The strip of trees running along the head of this park, should always be kept up ; wherever there are gaps, plants should be put in, and whenever any of the trees show symptoms of decay or dying, plants should always be put in to supply their places, and reared up as large as possible before the others be taken away. There are a number of very fine old detached trees through this park, as also several clusters, all of which should be preserved and kept up with the greatest

care. There are several blanks in the clusters which should be filled up; also a number of single trees could be put in throughout this park, particularly in the high parts of it, with great propriety and advantage to the look of the place, and to protect them, enclose singly, as before recommended. With great advantage, a number of transplanted old pollard trees could be put in, which would greatly improve the look of this field.

No. XXVI.

——— *Meadow.*

In the clusters and rows of trees in this meadow, there has been some of the most unaccountable cutting and thinning that I have ever met with:—For the most part a number of trees, not fewer than six and seven in many places, particularly the north side, have been all cut out of one place, which has made great blanks and gaps in many places. Healthy trees have been cut out very lately, and that not a few, which is spoiling these plantations very much, and in such a wanton manner, as it is totally impossible to account for such conduct. What the hand of the unskilful and merciless thinner has thought worth his while to leave, the ravages of winter have laid hold of; the improper thinning has let in and laid open to the storm many places, so that numbers are now and then blown down, and will be so to the end—plant as in No. XXIV. The roots of the trees cut are left so high, that it is really, to a lover of a beautiful lawn and fine trees, truly disgusting.

Dress up all the wounds of the trees here ; keep the whole up as long as possible—cut not a single tree out till they are dead in the top and root—before losing the timber, pollard such trees as die in the top, while they live in the roots, so as to become ornamental—plant in close, and fill up the blanks, as advised and directed in plantation, No. XXIV. No one will dispute the claims of the trees in this field, both as to shelter and ornament, and they deserve a degree of attention more than has hitherto been paid to them.

No. XXVII.

Belvidere, on the Estate of Balgonie, Haddingtonshire, September 1827.

The trees on the top of the rocks at the west end of this beautiful lawn are falling fast into decay ; this may be accounted for, first, from the dryness and shallowness of the soil ; second, from their exposure ; and, third, from their being allowed to remain too thick for too long a time, and thus in want of nourishment.

1st, A dry shallow soil is most unfavourable to the rearing of trees to a great age and size. We find that trees will grow on very bare rocky soils, provided the climate is wet and moist, such as the west of Scotland, &c. ; but here the reverse is the case, as the climate is very dry, and the ground we are now treading on is very thin and near the hard whin rock, so that the roots have not depth of earth to keep for them a sufficient supply of moisture, particularly so as the trees increase in size, and they always require an additional supply ; that being de-

nied them to sufficient extent, as they increase in size they require more, they grow slow, become languid, stunted in their growth, at last die. 2d, Their being on an elevated situation, and exposed to every storm that blows, is also much against their growth; had they been in a less exposed situation, although on the same soil, there would have been less danger of their decay. 3d, It is plain, and must be allowed on all hands, that the more trees increase in size, the more room they require, both above and below ground; but many of these trees having for so long a time been allowed to grow so close together, the storm has lashed them against each other in the tops, and destroyed their figure as trees; and as the roots must make new wood annually below ground as well as above ground, the thinness of the soil and the great number of roots or trees always requiring more room and nourishment as they increased in size, and not receiving either in sufficient quantity, they behaved not only to become, year after year, more languid in their growth, but in the end they die. It is a well authenticated fact, that trees grow faster from the age of twenty years till they be eighty years old, than they do afterwards; that is to say, they make more timber in every one year, betwixt these ages than they do in every four years after; this is easily accounted for, as during this age, supposing the soil to be good and not overburdened, and they receive all the nourishment, &c. that they require, the larger they grow they require the more nourishment, and not receiving the increasing supplies they require, they must grow slower; therefore, I say, that notwithstanding the soil and situation, had these trees been thinned properly out in time, they would

have been much larger, more healthy trees, and lived longer. In all places of this kind, early thinning, and attention to the rearing should be particularly attended to. As this is a very conspicuous situation, and adds great beauty to the place, to have a cluster of planting, of any kind, all the trees that will live should be kept on it, and only cut out such as die. A number of them may also be tried as pollards, as has been pointed out.

But to cure all these maladies, and to obtain security for the future, this most desirable of all objects, a proper cluster of ornamental, as also trees of all descriptions, on this spot, attend to the following method. Inclose a given space—I should suppose it may be carried west to the top of the rocks, which will save some expense in enclosing, and a little more ground both on the south and north of the old trees may be added; still should this addition in the least intercept the view from Balgane House, the cluster of old trees may even be divided, and an avenue opened through them for a view; or if the proprietor should think it more advisable to keep by the old boundary, it will do the same as adding to its size; but I should think to divide it into two separate oval or round clusters, the most interesting and picturesque. Whichever is fixed on, let it be properly enclosed, and then plant up with larch firs at four feet, plant from plant, with a spruce, silver, and Scotch fir alternately at every sixteen feet from each other, on the new ground, and plant wholly larch trees amongst the old trees, at three feet distant, wherever they can be got put in. When the larch is four feet high on the new ground, cut out the one half and put in oak, Spanish chesnut, plane,

elm, and beech alternately, and cut them over, planting at west approach; and rear these kinds up as standards, at proper distances, leaving a part of the evergreens also to rear up. When the larch firs, amongst the old trees, are three feet high, cut out every other tree, say every second tree, and put in chiefly spruce firs to be topped down for underwood, taking care to keep the whole ground always full of underwood. When any of the old hard wood trees dies out, be sure to rear up a tree from the underwood to supply its place. When the larch firs are to be taken out, in order to the planting in the other trees, be sure to cut them over, and not dig out by the roots; and when cut over, prune the trees cut, and leave all the twigs, say branches, to consume on the ground. This method, together with keeping the ground completely full of underwood, will at once cure, in a most satisfactory manner, the dryness and thinness of the soil, as it will keep the roots always damp and moist; so that at all times, and to all ages, the trees will have a sufficient supply of nourishment, and the larch firs, although never intended, nor will they ever come to be timber trees here, yet by allowing them to stand for so long a time, they will enrich the soil and make it fit to carry trees of every description to maturity. Again, when the tops of the underwood comes half way up the naked stems of the old trees, or up to the lowmost branches, this will completely shelter them, and cure the storminess of the exposure; and by attending to the thinning and selecting out the standril trees in time, before arriving at too great a height, the three evils which have been the ruin of this once beautiful plantation

will be completely cured. The fine beech in the avenue, that is diseased with the canker, will have, I am aware, before this time, been attended to, as to its means of cure, if so be it will cure, according to the directions and instructions given the forester on the spot; and should it succeed, if any other tree is seized in like manner, he has the receipt for the balsam, and can apply it. A little of the hard sward amongst the roots should be mellowed up and mixed with the fresh earth to be laid on. The same method as described in this plantation should be attended to in all similar cases and situations, whether as to a whole planting or as to single trees, &c. The enclosing and planting should be done immediately, and if so, it will save the life and revive in health of many of the trees already on the ground; and if not attended to, the place will soon be without a living tree. I predict this from real experience in many similar cases, and have often proved the utility of the cure prescribed to a demonstration.

Craig Muir Young Planting. Balgone, Haddingtonshire, September 1827.

This is, from the great quantity of bare rock in it, a very difficult, or I may say, critical spot to plant; and it is of very great importance to rear planting of any kind on it, and nothing will obtain a full crop but perseverance. I am of opinion it is of no use whatever to be at the expense of either plants, or planting on the very bare rocks; that is

to say, where there is very little soil, as enough of this has been already done to convince of its impropriety. The method to be followed up here, and in all similar places, is to put in oak acorns upon all the rocky places, where there is not above from one to eight inches of soil of any kind ; wherever there is from one inch of soil, up to eight inches, the whole should be planted with acorns, as a very few acorns will go over the whole ground ; the expense is trifling ; they may be put in at one foot or eighteen inches distant from each other ; so much for all the very bare thin places. There are a great many hollow or furrow places, betwixt and amongst the rocks, where there are depth of soil ; and in many places of this kind, within the said boundary, the plants are thriving well. Now as it is all and every thing to get up a planting of any kind here as soon as possible, plant all such places with larch firs first, and nothing else, at two feet distant, plant from plant, putting the larch firs up the face of the bare rocky places, wherever the soil is above eight inches deep ; where the acorns is to be planted, and persevere in keeping the ground full of larch firs, till they are from four to six feet high, when they will have killed the heath or every pernicious weed, and made a fine soil ; then cut the larch firs out to four feet, plant or tree from tree, and plant in oak, Spanish chesnut, plane, beech, ash, elm, Scotch, and spruce firs. As the larch is by no means a tree that is to come to maturity, as large timber, or to be ornamental here, they may be cut gradually out, and trees of any other, or at least of the above kinds, put in ; by this means the whole ground will soon be covered with trees. Observe, as the tops of the

larch plants rises up to cover the rocks, or afford shelter, put in plants on the rocks alternately, above them ; observe also, that the plants already into the hollows that are in a thriving state, may be allowed to come on ; but by all means fill up with larch firs amongst these also, as they will most effectually enrich and make an excellent soil, and the expense of the larch plants is a mere trifle. After the larch firs have come up to cover all the bare rocks, &c. and the hard-wood plants put in for the first time, the second cutting of the larch firs out must not take place till the hard-wood trees have been once cut over, and the new growths coming up, as has before been observed ; this is both a sure, simple, and cheap, method of obtaining planting on such places. There is, however, another plan, equally sure and much more speedy, as it will give almost the immediate effect or show of a plantation, even on these bare rocks ; and is attended with no very considerable expense : that is, to remove from a new cut coppice, or under-wood, stools, or roots of oak, or any other tree that grows from cutting, when newly cut over, and properly dressed up for the growth, and place these down upon the rocks, being careful in lifting them, with as much earth about the roots as possible ; and if there is the least crevice or chink in the rock where it is placed, the young fibres or roots find them out, and they never go back. I have seen growths, from stools removed, and placed on bare rocks of this kind, from eighteen inches to three feet long, in one season, and never went back. The stools or roots of trees of any size will do, provided they are healthy ; but the most portable and easily removed, are young trees from four to eight inches

diameter, when cut over at the roots; by this method, the most bare, rocky, and exposed situations may at once be planted. Where there is depth of soil and shelter, the whole tree may be removed; but this is plain to every one. In spring 1825, I covered upwards of a fourth of an Irish acre, of as bare rock as any here, with roots of oak, ash, Spanish chesnut, plane, elm, and some willows, and not one of them but grew, and from many of them are trees now ten feet high; this was done to cover up the view of the bare rock from the mansion, and it served the purpose instantly and most effectually. There is no coppice cutting on the estate of Balgone, I believe; but for the purpose of covering any particular spot, the oak, ash, or even other trees that are to be taken out of South Meadow, may be used so far as they will go, or from any other young plantation, when such can be taken out with plenty of earth, without injury to the rest of the trees. I have been the more particular with this plantation, as it will serve all others of a similar kind, and on any of the other estates or places.

Plantation to be made in a Valley, Balgone.

Nothing, in my opinion, would add more to the sublime grandeur of the already indescribable romantic scenery to be seen in this vale, (where the immensely high, wild, perpendicular rocks would almost make a stranger believe he had been in a trance, at once carried from the fertile lands of Haddington to the wilds of Argyle or Inverness-shire,) than planting the whole ridge of these rocks, and a pri-

vate walk made all along their basis from east to west the whole length of the valley ; which planting should be made a sufficient wideness out from the basis of the rocks, so as to form a serpentine walk curving out and in towards the rocks, the curves to be so sharp in some place turning in to the rocks so as to have a full view of the most rugged and wild parts of them, which I would term the wilderness walk. As this place, from its soil and situation, will carry every kind of tree up to maturity, the kinds to be particularly cultivated as the standing timber trees, are such as grow to the largest size, and live to the greatest age ; for this purpose, the oak, Spanish chestnut, beech, plane, silver, spruce, and pinaster firs, these kinds to be regularly thinned out, and trained up from the plant to stand at the distances, always keeping it full of ever-green wood in the same way, and on the same principle, and attending to the same system as laid down. It will not be improper in this well sheltered place, to plant even a few larch firs to be reared up as timber trees, as they will grow very fast here ; where the soil is very bare and shallow near the rocks, acorns may be put in. The proprietor will be pleased to observe, that in the method proposed, and to be followed up here, I am considering the whole of this valley, from the Sowhole west to and sweeping round the west end of the rocks, to have a made walk or ride from the mansion through the Belvidere lawn, to enter the wilderness walk at the south-west end of the rocks, also the walk or drive through Balgane strip to join crossing the valley at the head or west end. The meadow either to be laid down in fine pasture, the

whole extent of it as a fine lawn of pleasure ground, with the circuitous offsets of planting almost meeting each side across the vale; also a part or parts separate from each other may be laid down, say converted into flower gardens, turning the whole valley into pleasure grounds and planting. This would add an immense value to the estate of Balgone, and the whole plan can be executed at a very little expense, comparatively speaking, nature herself having with a masterly hand sketched out the enchanting and superbly grand, yet truly romantic scenery, which, when finished by art, as pleasure grounds and walks about this place, it will be surpassed by none, and equalled by few in the country.

No. XXVIII.

Round Stable Padock, at Powerscourt.

In this field there is a magnificent ash tree, which is not only well worthy the attention and care of the proprietor, but is also worthy the admiration of strangers visiting Powerscourt. I suppose it the largest tree of the kind in Ireland; at all events it is the largest I have heard of, and it is the fourth largest tree of ash I have ever seen either in Scotland or England; it is still healthy and growing, and I have no doubt but it may increase in size for a number of years. This grand natural production girths, at the smallest part of the bole, twenty-one feet, and a little higher and lower thirty feet; though the the main trunk be but short, it sends up two magnificent and truly beautiful stems; measured close to where they spring from the main trunk, each will

girth within a trifle of the trunk at the smallest place, and then run up to an immense height—taking this wonderful tree in all, its solid contents is not less than from 600 to 700 cubic feet. By taking down a small part of an old wall, which I understand is now of no use as a fence, and one or two trees, it would open a most beautiful view of it from the present approach to the mansion, from which approach I think a private foot-walk should be made to this sublime and grand tree. There are a few blemishes in it, which will hasten its decay; these should be immediately dressed up and covered over; supposing the timber of this tree to be all sound and wholesome, and cut down, at the present selling price of such timber, its value would be L.97, 10s. Where is the proprietor that would not protect, to the very last stage of decay, such a treasure of value and of ornament, handed down to him by his forefathers? Surely nothing but dire necessity would induce him to do otherwise than to transmit it to his posterity. A little above this tree, in the same field, are two very fine planes, at present (21st April) in full blossom; these early announcers of the approach of reviving spring are well worthy of notice and attention. There are two large ash trees which stand right in face of these planes, one of them in particular is spoiling, and should be taken down, to give full scope and view from the approach road; both of these ash trees may, without the least injury to the look of the place, and a great benefit to the two planes, be taken away; if so, they should be taken out by the roots. There are a number more of fine old trees in this field, much in want of being properly pruned, and the blemishes dressed up. The clump of young

trees in this field should be thinned out immediately. From the length of the trees it must be done sparingly and gradually, taking particular care to leave always the longest lived, most healthy, and what is likely to be even the most ornamental trees, and rear them up to maturity; save the spruce firs and take away the larch, where there is a choice, as the larch firs will not live to be large trees in this situation.

No. XXIX.

Racecourse Field.

The whole of the detached old trees, with the strips round the outsides, should be carefully kept up as trees; not one of them taken down as long as they will stand. There is also a round clump of old trees in this field which should be kept up; from its exposed situation nothing should be cut out of it; where blanks occur, fill them up as recommended in plantation No. XXIV. In this field is another young strip of planting; this on the south requires a little thinning, and if done judiciously, will be of great advantage to it; from its exposed situation this must be done gradually, till the trees stand at equal distances of about eighteen feet, tree from tree, at which, on the top of this bank and on all the exposed places, they may stand as a finished plantation; where there is a choice, take away the larch fir, and spare any other tree in preference. The trees in this field, called Daly's Wood, or Bottom of the Course, are for the greater part very thriving, and will grow till they become of very large size in such a situation. Here, with great pro-

priety and advantage, a few trees may be taken out, which should be done this spring, and the remaining trees dressed up. The particular trees that should be taken out here were pointed out as I went along, say about twenty in all; so that they need no farther description. It is always to be understood it is only the dwarfish and unthrifty, and such as never will be proper trees, and are at present injuring their neighbouring trees, that are to be taken out. The strip along the dike side, on the public or common approach to the mansion, together with the row of trees outside, say on the south of said approach, forms a fine avenue, and screens the common from the private approach. I may here be permitted to observe, that I am an advocate for keeping up entire, all old avenues of large timber trees about a mansion or seat of a proprietor; and I am of opinion, that nothing gives a place an air of antiquity more than they do, and should never be cut down but at the direction and desire of the proprietor. In this, however, I differ from almost the whole of my profession of modern improvers, whose plans are to cut these up into detached groups. The present Earl of —— sent a professional gentleman from England to improve his woods, &c. on his estate in Scotland, and he cut all the fine old avenues of trees leading to the Palace of ——, into small irregular groups of about three and five trees, which, when the Earl came down and saw, he would have given, as he himself expressed it, the half of the whole property to have had these beautiful avenues of trees up again. I could give a great many more instances of this kind. No one that ever saw the indescribably beautiful avenues of lofty trees at and near the castle of Inverary, the seat of the

Duke of Argyle, would believe that any man in the possession of his rational senses would ever cut down such beautiful avenues.

No. XXX.

—, *West to the Mansion.*

In this clump there have been, although a considerable time ago, a great many trees cut out; it must be evident to the most superficial observer that this is its misfortune, and will in the end prove its ruin. It has already been the means of many being brought down by storms, and which will bring down many more. There is at present one of the best of the beech trees blown over, and allowed to lie on its neighbouring tree, which is not only destroying it, but if allowed to lie much longer, when the tree gets into foliage and heavy in the top, the first gale of wind will take both trees down, and a great blank added to those already made. There is in the same place a large oak in the same state; both trees should be immediately taken away. Fill up the blanks here with oak, Spanish chesnut, spruce and silvers firs. When a tree is blown over on its neighbouring tree, not a moment should be lost in taking it down; for if allowed to lie, ten to one but it will bring down the tree it lies upon.

No. XXXI.

There is here some very fine trees; two of the

elms very much destroyed by cutting off the branches ; if this was necessary, as is said to be the case here, why not cut them close into the trunk of the tree, and dress and cover up the wound. Nothing can be more disgusting to the eye than to see trees mangled in this form, nor can any thing be more ruinous to the health of the tree. All such branches should be immediately cut close, and dressed up as recommended in plantation No. IV.

No. XXXII.

Trees about the Garden.

As these trees both afford excellent shelter to the garden and mansion, and are also very ornamental, the whole of them should be kept up as long as possible with the greatest care, and those only taken out after they become perfectly dead before their timber grows useless, and other trees put in and reared up in their places ; dress up their wounds as in No. IV. All trees for shelter should be kept closer on the ground than in a plantation, particularly about a garden. Supposing large trees to be singled out to 24 feet, tree from tree, or at most 30 feet, they should always be thinned out so as another tree might stand in the gap betwixt each of them, and underwood should be reared betwixt them, covering the naked trunks of the large trees.

No. XXXIII.

Hollow.

Here are some very fine old English elms, almost the whole of which should be reared as long as time will allow them to stand. In one place where four trees stand in a group, two of the elms may be taken out, say the two worst of the trees, but nothing more. Here are some very fine healthy young Spanish chesnuts, which should be reared up with great care. As these trees are excellent for ornament, live to a great age, and grow to a great size, as also very profitable to cut down as timber, in all places of the plantation where these are, they should be cultivated with great care. One beech tree will be found here, marked to be taken off one of the best of these chesnuts, which should be done immediately. There has been a fine healthy Spanish chesnut cut here, which is a great pity; almost any tree should be cut to give scope to this; but being in an open place I am thoroughly at a loss to discover the reason for taking it out. Some other large trees have been taken out here, for what purpose I cannot devise. There is a fine bank of wood here, down towards the river side, which wants a little thinning, and if done judiciously will much improve it. Take out all the bad ash, dress up the stools, and allow them to come up as underwood, which will be fine shelter for game, &c.

No. XXXIV.

_____'s Bank.

The clump on the north-east end of this bank is fast falling into decay; this has been hastened by the careless manner in which it has been thinned. On an exposed bank of wood of this kind, nothing should be cut out of it after the trees arrive at the height of sixteen feet, when the thinning of all such should be finished. This bank will wholly extirpate itself if not soon filled up; it should be immediately planted, say all the blanks with the oak, Spanish chesnut, Scotch and spruce firs.

The strip along the foot of this bank wants a little thinning, and if done in a proper manner will much improve it. When there is a choice, take away the larch firs, as these will never be ornamental trees here. From the height of the trees, it must be thinned cautiously and gradually. The round clump joining the _____ strip should be immediately filled up by planting in oak and Spanish chesnut. There is a beech tree, beside a Scotch fir, dead in the top, it should be cut over as a pollard, which will save the lives of both trees for many years. When the pollard is finely topped, take away the Scotch fir. As this is a very conspicuous knoll, the old trees should be all saved and nursed up with care and attention.

No. XXXV.

A Bank near the House of Powerscourt.

The old trees on this bank are a very great natural

curiosity; there is to be seen many fine healthy and large trees, two beech and a Scotch fir, growing out between each, and that to within a few inches of each other, and some of them averaging in girth upwards of seven feet. This, I confess, is wholly new to me. I have never, in all the course of my profession, met with any thing equal to it; say different kinds of trees growing as it were from the same root, and that too in a straight row, to such a size and degree of perfection. These trees are well worthy the inspection of strangers. Observe, it is no rarity to see one of the same species grow from the same roots to the size, &c.; but trees of different species, and so much so as beech and Scotch fir; these trees are worthy the proprietor's attention, and should be kept up with care. Two of the beech trees here should be topped as a pollard about 17 or 18 feet up from the ground, allowing all the branches to remain under that height. This will give scope to all the three, &c. In the bank along the foot on the north side, are some fine Spanish chesnuts, which should be relieved to get scope to become ornamental trees. This bank being a continuation of the last bank, wants all a little thinning. Strangers visiting the beautiful mansion of Powerscourt should never leave the place without seeing these trees.

No. XXXVI.

Field.

In this field are some very fine healthy old trees, and it would much improve the look of the place to

turn it into a lawn of trees, which should be done by taking away some of the bad looking and worthless of the trees, and dressing up properly those that remain. There appears to have been some very fine large old trees taken out here, from their stools, which have been left above the surface, uncommonly high ; these old roots should be grubbed out ; it would give more pasture and a much better look to such a field, nothing on the river side should be touched. The best and largest of the trees have been formerly cut here, but let it be understood what I mean should come out, is the very worst of the trees, leaving as many of the best trees as are necessary for the purpose of having a fine show of lawn timber trees. All trees in a lawn where the surface is even and always in pasture or pleasure grounds, should be singled out to about 40 feet, tree from tree, and that too as regular as possible.

No. XXXVII.

————— *Meadow.*

On the south-west side of this bank are some very fine evergreen trees of Scotch and silver firs, which are great beauties so near the mansion ; also some hardwood trees, all of which should stand as ornamental trees. There is a bank of wood at the foot of the pond requiring a little thinning ; also some draining to obtain good trees, which is a great object so near the pleasure ground. One or two badly topped dying ash trees may be taken out, as has already been noticed ; nothing is more ornamental

about a gentleman's seat than trees, and of various kinds. Evergreens should bear a predominant part, say Scotch, silver, and spruce firs, as these are always the same in winter as in summer.

No. XXXVIII.

———'s Bank.

This bank is a very fine spot for wood, but there is not at present half a crop on the ground. Take away all the dwarfish and unthrifty trees, as also the most of the alders. Drain the wet places; but where dry, and can be kept dry, plant with oak, Spanish chesnut, elm, and plane. In places where it will be always damp, plant tree saugh and poplar. In this bank by the river is a particularly fine old oak; on the top, a fine silver fir, which are specimens of what perfection trees can be brought to. In all plantations where the trees are unshapely, and not healthy, it is much better to cut them down, and rear up trees, either more profitable or more ornamental; nothing betokens a place going into decay or neglect, more than to see trees of this description remaining, when by a little attention the ground could be covered with fine healthy thriving trees, where the soil and situation are favourable for them.

No. XXXIX.

——— Bank Young Plantation.

This Bank is of excellent soil for rearing trees of

almost every description; and as may be seen from the trees on it, will rear them very rapidly, although the larch firs, where they have stood good, have got the ascendancy of the others, still from the exposed situation of this bank, the larch will never come to be a profitable, ornamental, or long lived tree here. The top of this bank, in particular, commands a most extensive view of the adjoining country.

I am of opinion that a triangular row of spruce and silver firs along the top of the bank, should be planted and reared up to maturity, as standing timber trees; for this purpose, plants of this kind should be carefully put in, and reared up at fifteen feet, tree from tree, which when up, will cover the look of the place as if it were a forest; wherever it is necessary to fill up blanks, that should be done with spruce and silver firs; rear and thin, and cut the other trees as they come up, gradually and to regular distance, as recommended in No. XXII. say ——'s Glen, the young part of it, leaving a variety of the kinds already planted, only where there is a choice, take away the larch firs. The belt of old trees on the top of this bank, is both sheltering and very ornamental. There has been a very considerable number of these trees cut lately, which from their stocks, appear to have been very healthy; had there been some, and that but a very few, taken from the back part of this belt, it would not have been so bad, but the trees taken are from the front of the bank, and the very worst place they could possibly have been cut out of. I would not have thought there could have been a man found in the three kingdoms, in possession of his right mind and his eyes open, that would have done such a thing; any person wishing to see the

absurdity of such work, need only look at the roots of the trees cut, and see where they are cut from, the roots of which are covered over with turf, which shows plainly the thing was no sooner done than repented of, and the error discovered when too late. Large old trees should never be cut down in any conspicuous situation without due deliberation.

No. XL.

— *Young Plantation.*

This plantation, particularly the old part of it, wherever there are blanks, should be filled up with oak and spruce firs chiefly ; larch fir is not at all a tree suited to this place, as they will not live long, nor come to maturity on this soil and situation. As this plantation should be reared to timber trees, to stand as a wood or forest of trees always full and covered with underwood in the young part of it, there is by far too many Scotch firs, and in some places there is nothing else ; where this is the case a part should be taken out, and hardwood trees put in their place. Put in the hardwoods, say oak, ash, elm, and plane alternately at twenty-eight feet distance, tree from tree, keeping a Scots or spruce fir between each. As a wood or forest, at this distance, they may stand to be reared up to maturity, keeping the ground always full with underwood. Where the firs are already begun to kill the hardwood, they should be taken out, and this gradually, as advised in——'s Glen, Young Bank, No. XXII.—There are a number of the hardwood plants, say beech particularly, in the oldest part of it, that require pruning

very much ; trees at the height they have arrived at, may with safety, and should be pruned too, for their future shape as a tree, but when they get older the pruning knife should never be applied, except in cases of necessity. By a judicious pruning of trees, or more properly may be called plants, at this height, say from two to four feet high, the future shape and health of the tree may be in a great measure determined. To keep underwood in plantations of this kind, is very useful for the health and growth of the old trees to be reared to maturity, and by having the underwood of oak, it may be turned to excellent account by cutting it over every twenty years or so, as an oak coppice, &c. at same time affording excellent shelter for all kinds of game.

No. XLI.

Young Plantation.

This is a most excellent soil for rearing trees of every description, although very poor and inclining to moss, and the situation high and bare for miles round it ; for although the situation is bleak and exposed, yet in planting a large field of it together, it may be made a fine plantation, and will be of the greatest use here in covering the cold, bleak looking, naked moor, and will not only warm, shelter, and cover the bare appearance of the place itself, but will ornament and beautify the whole of this bare looking country for many miles distant. For which important purpose, not only what is already planted, but a great deal more should, and could, with great pro-

priety and advantage be added to it; as the land for the most part is adapted for no other purpose, and never can be brought to pay one shilling, for twenty that it will do in planting. Let us consider a plantation to be made and reared here solely for profit, and to insure a regular annual return of profit; it would be to plant the whole, or part of it on a proper principle for a natural oak coppice (and I may observe, by the way, that the coldest and most barren places of these mountains, will carry oak coppice) and cut over (after being brought to a proper system) every twenty-four years; dividing it into twenty-four regular yearly cuttings, it will produce at the rate of seven pounds sterling per acre of annual rent; and that too, for any length of time without expense of keeping; but to keep the fences good, which can be very easily done in this place, where the stones are got for the lifting up; were this plan to be adopted, the method for planting and converting it into a natural oak coppice, is to plant the whole after being enclosed with oaks at eight feet distant, plant from each plant, with a nurse tree of larch or spruce fir between each, which should be cut away when the oaks get to the height of four feet, and at the age of fifteen years, or thereabouts, the whole of the oaks should be cut; however it may be proper to observe, that the oak and bark will not pay so much the first cutting, as there is but one stem from the plant in place of three or four, that can be reared from the stocks in after cuttings. (See this fully explained in my Forester's Guide.) After the first cutting at fifteen years, they should be cut every twenty-four years thereafter. Observe, that an oak natural coppice requires no shelter after the first cutting, however exposed the

situation may be ;, but to ornament it as a plantation in this place, all along the top, sides, and foot of the hill, should be skirted with standing trees of spruce, Scotch, and silver firs ; say a double row planted and reared up in a triangular form, which would always keep up the view or look of it as a standing plantation, and the interior to be cut even, as aforesaid, as coppice, and maiden trees left every cutting amongst the coppice, which will always give the whole the look of a plantation. But to have this always as a wood or forest, it would be well to rear trees of every description on it, and then I would recommend to plant oak, Spanish chesnut, Scotch elm, ash, plane, Scotch, spruce, silver and larch firs alternately. To give variety to its look at a distance, these should be planted, thinned, and reared up as described in ———'s Glen, No. XXII. keeping always the ground full of underwood. Should the proprietor prefer this last plan, I would advise that the triangular trees of evergreens, as formerly recommended, be planted round out sides. I would give a preference to the first plan, as it may be made to answer both the purpose of ornament and profit.

The present enclosure, already made here, requires planting up, which should be immediately attended to in one or other of the proposed plans ; it is well enclosed, and only needs to be kept full of plants to make it a plantation ; where the heath is very strong, it should be cut down before planting, and where the soil is very bare, plant larch firs, in order to make a soil. See my Forester's Guide on planting waste lands. As I said before, a great deal more land should be planted here, particularly the field immediately before this enclosed plantation—it is really

worth being looked into and planted, as very great advantages in many respects would be gained to the property by it; but this does not come under my authorized survey at present.

This is an exceeding high exposed situation, yet the plants in the small clump of planting made on it was doing extremely well on some places, although very little attention seemed to be paid to it.

No. XLII.

Powerscourt Wood Park, South Side.

Here again I am under the disagreeable necessity of lifting up my standard against a system of planting; and I have not the slightest doubt of hazarding the remark, that every professional man the least skilled in planting would do the same, although the task is exceedingly painful and irksome; yet I am totally at a loss to know how I am to get at the kernel without first breaking the shell; this shall for the present be passed over, as much as possible; nor will I take any notice of the waste of plants and expense of planting; in the finest of soils, most sheltered situation, at eighteen inches, and two feet plant from plant, planting into a bog in the very midst of a running stream of water, planting on the hill where it is exposed, at three and four feet distance, with large plants of Scotch fir, &c. The roads formed through this side of the park are a great improvement, being most tastefully and admirably laid off, which serves to improve, facilitate, and dignify the whole place. It must be plain to a de-

monstration, and agreed at all hands, that to have standing ornamental timber trees here, is everything that is required, and to obtain which is the great and leading object to be kept in view; for this purpose, a selection of the longest-lived and most ornamental trees, at proper distances, should have been, and should yet be planted. This desirable object may easily be obtained at a trifling expense, safely, permanently, speedily, and beautifully by the following method: Plant the oak, Spanish chesnut, Scotch elm, English elm, ash, plane, beech, spruce and silver firs alternately, at from thirty-two to thirty-six feet distant, plant from plant, in all the blanks betwixt the brow of the hill, say, as far up as the highest of the old trees, and down to the river; enclose them singly with small stakes, warp these for two feet up with the small branches of larch fir, which will last for ten years,* and most effectually protect them from deer, hares, rabbits, (although these were as thick as the ground would support them,) and also from the storm, blow as it will, till they were trees of such a size as to be completely out of danger. Being thus securely sheltered and protected, they will grow as much in one year, and that too without the risk of misgiving, as they otherwise would, in three years, the soil being excellent, not to mention the present planting, which, to say the least of it, is no planting. But to the expense,—50 trees will be sufficient for each acre, as a lawn of ornamental timber trees, particularly here, these 100 acres will take 5000 plants, at 25s. per thousand, is L.6,

* I have known the warping of paling by branches of larch fir, keep out hares, rabbits, &c. for twenty years from a nursery with very little help.

5s. the expense of planting and enclosing singly, for workmanship alone, supposing the wood for the stobs to come from the estate, as the present railing, including nails and workmanship to the full, L.66, 5s. add plants, L.6, 5s. is in all L.72, 10s. I am not aware if there will be 100 acres of the bank referred to, after deducting the ground already occupied by trees, to plant, but suppose less or more, if so, the whole will be planted and protected effectually without risk or farther trouble, for L.72, 10s. I am doubtful if the present system has not cost four times that sum. If large clumps or clusters of planting is to be made on the top of the hill, enclose these clusters singly with stone or paling, &c. If with a wooden paling, I would recommend the small stob paling as by far the cheapest, say four stobs to a yard, as it only uses such thinning or crops as cannot be sold, whereas the sawing strong rail paling* takes wood that can be sold readily for a high price, besides the expense of sawing, which is very high. When the whole is planted, which may be easily done in one season; turn the deer in, or indeed they should never have been out of this side, as will be afterwards shown, nor will it in its present state be a very easy matter to keep deer out. Plant the cluster on the top in the exposed situations, with oaks chiefly, at eight feet distance, and large old plants with good roots cut over before being put into the ground, then they will never shake with the wind, nor slacken them in the roots till they have gathered strength to

* This is a species of paling with very strong stobs at 12 feet distant, and 2 rails of spars of sawing timber, 4 inches broad by 2 inches thick, which is very expensive, nor is it near so good a fence as the small paling.

support the tops, nor will they ever require replanting. Spanish chesnut, elm, ash, and plane will do equally well with the oak; by this method, plant in larch and other fir seedlings betwixt them, not older than two year seedlings.

To prevent strangers from making the planting in the water and marshes proverbial, the plants should be instantly removed and the places drained; in any very conspicuous place, a pollard tree could be transplanted in. The few trees to be taken out from amongst the old ones, were almost to a tree, fixed on in presence of Mr. —, who I have reason to trust, will see to them; they must of course be few and far between. Any tree, so far decayed, that the bark and timber will be worth nothing to sell or cut, it would be much better to cut as a pollard, (see No. IV.) as it may in that case become ornamental, while its intrinsic value is now almost nothing. As to making a plantation of timber-trees by pollards, &c., the present —, Lanarkshire, built a new mansion in a field where there was not a tree; he in two seasons transplanted 500 trees, many with their tops whole, 50 feet high, and not 20 of them misgiving, made a complete lawn of large timber-trees in two years; many noblemen went to see, and were admirably delighted with the heaven-like grove, which was formerly barren waste land,—as inferior to that on which I am now treading, as sand is to fine flower. In Lord Morton's deer park 500 pollards have been put in within these five years, and not 50 out of the 500 have misgiven, and only enclosed for a few years. Young healthy trees, from 10 to 29 feet of wood,

make excellent pollards to transplant, and are most beautiful trees in two or three years ; many specimens of these are to be seen on this same property, which have also been pointed out as we went along.— See method of transplanting, &c. in my Forester's Guide.

No. XLIII.

Wood Park, North Side.

The whole of the old trees, which are for the greater part oak, between the waterfall on the river going upwards, about the summer house, and between it and Mr. ——'s house, should all stand. To every lover of fine scenery and fine trees nothing on this earth could be more enchantingly delightful. A certain author says, "What would heaven be without trees?" The bank of trees from the waterfall down towards the new Cottage, or March of Bahanna, with the exception of a very small portion of it near Bahanna, is growing on land totally unfit for any thing but growing trees ; indeed in the far greater part of it there is scarcely a particle of grass to be seen growing. This bank of wood has been very injudiciously thinned by taking good healthy trees, and leaving the unthrifty, not to mention the shameful cutting by leaving the roots of many of them more than a foot above the ground, as well as many unaccountable blanks and gaps. The greater part of this bank has been at one time cut over and reared up from natural shoots, particularly towards the top of the

bank, where almost to a tree they are growing from the old stool. This bank would admit of a partial thinning, but in its present state, while the deer are at large in it, it would be doing the greatest injustice to take a single tree from it, as, notwithstanding their stunted state, many of them if dressed up would grow from the old stools; and here from the stony and rocky surface it would not be so easy to enclose and keep up a single enclosure round them as on the other side. As it is plain the deer have no meat on this bank, run a temporary paling or fence down from the dike above to the new dike at the back or north of Mr. ——'s house, nearly in a straight line to the upper corner of the dike; also a temporary paling along the foot of the bank to the east, and cut over all the old natural stools of oak along the top, and for nearly half-way down the bank, leave all the fine old healthy trees along the foot; as also all the healthy trees growing from the plant in the bank. Dress up for the growth the stools of all cut; plant up the whole blank ground on the top of the bank up to the dike in the same manner as directed in the other side; and in a very few years the whole of this bank, which is fit for nothing else, will be covered with fine timber trees, a number of which should be always kept up for ornament, and the ground kept full of oak coppice, it not being fit for pasture, and cut out every twenty years such as is fit for barking; the ground here being quite different from that on the other side. This should be attended to immediately, and in a few years, instead of old scraggy unthrifty trees, there will be fine healthy beautiful trees, which could be reared up for any purpose. As the deer

will never have meat here, they should be immediately turned over to the other side, and part of the expensive paling taken to enclose this bank in a temporary way, as described. Indeed it will be found a very difficult task to keep the deer out of the other side. If any planting was to be in the side above the waterfall, it should be enclosed singly as on the other side, so as the deer may have the whole range on both sides, except this bank, and this too, if attended to, after the first twelve years at longest. Keep all the alders on both sides of the river for ornament as long as they will stand up. Observe, that in coppicing this side there must always be a number of standard trees kept in it, say at sixty feet, tree from tree; this will always keep up its look as a plantation of ornamental trees, and the coppice or underwood covering the rugged surface, which to cut every twenty years will also be very profitable. The truly bold and sublime prospect which this park, as it is called, presents to a stranger entering its gates, with the lofty grandeur of the fine trees mounting to the top of the hills on both sides, together with the waterfall, cannot fail to make the contemplative mind pause and admire.

No. XLIV.

Powerscourt Glen Wood.

Here is an exceeding fine, although small spot of natural coppice wood, unfortunately chiefly birch; but where there are oak growths, although they have

never been either dressed up for the growth, or cared for, yet they are fine. The whole of this little enclosure should be cut over this season, and the stools of oak carefully dressed up for growth. The whole of the birch should also be cut over, barked, and the timber cut into barrel-staves, and the birch growths extirpated, and the whole ground filled up with oak, converting it into oak coppice, for which both the soil and situation is admirably adapted. The oak barking should be commenced immediately, and finished before the birch, as it will do to bark, so late as the month of August. The timber of the oak is remarkably suitable for making into cart and chaise wheel spokes. For the method of barking the oak, birch, and making the timber into spokes and staves, see it briefly described in my Forester's Guide. As this wood is of full age for cutting, it should be attended to without delay. The profit to be derived from natural oak coppice cut every twenty-four years, may be beautifully illustrated by this wood. I suppose it to be thirty years, or not exceeding that age; and there are many stools in it worth 15s. wood and bark, which the same ground could have reared up to the same age, say at eight feet, tree from tree, or stool from stool, which are 800 odds on each acre, supposing the ground to be covered with oak alone, at 15s. each stool, is L.600 for the crop of thirty years growth, which is L.20 of annual rent for every acre, as the refuse of the wood and additional stools will be sufficient to pay the expense of manufacturing; but to bring it down to cuttings at twenty-four years, and suppose only the one half, allowing all the rest to go for the interest and the annual rental, &c.,

here is L.10 of yearly rent per acre for land; I suppose, not paying the proprietor 10d.; where will the very best land pay like, or nearly like this; when reserve trees are kept, and these healthy and strong for two or three cuttings, and sold with the coppice, it generally pays more. A skilful person should go through before beginning to cut, and mark with paint, or number with a wood-iron a few of the best and healthiest of the oaks as standard trees; these should be selected, chiefly from the plant or seedling and not from a stool; at as equal a distance as possible; when cut over, the fences should all be made good, and the whole blanks filled up, and the birch planted up with oak, a great part of which may be done by layering from the growths of the stools; for which consult my Forester's Guide on planting. This is worthy of notice and immediate attention. The cutting and barking should be begun immediately.

No. XLV.

Coppice.

The coppice on the two farms is said to be only seventeen years old, and it is truly wonderful to see such fine growths of oaks as in many places here, at that age; it neither having been dressed up properly when last cut for the growth, nor has it been properly cared for, since it has been mostly pastured, so that a proper profitable crop of oak cannot now be reared on it for this cutting; the whole should be cut over also this season, the birch extirpated, properly enclosed, the blanks planted up, and afterwards

oared for and done with as recommended in the preceding coppice of No. XLVI. A very fine choice of reserve trees can be obtained here, which should be carefully marked ; here is also a great deal of more fine land for oak. Natural coppice could and should be added to this.

No. XLVI.

Leachenderry Hill, on the Estate of Powerscourt, Ireland.

Having examined this hill, although a little out of my way, not being called on to report on land fit for planting, where there is no planting, but this part being so closely connected with Glencree, it was impossible I could shut my eyes from taking a view of an object so interesting to the estate. There is no part of the country, however remote or distant, that a view of this hill cannot be got from. It must be confessed it would be sublimely grand, to have it covered with wood, and not only considered as a great ornament to the estate to which it belongs, but to the whole surrounding country ; it would be also a great national beauty when viewed from the ocean. The most part of this hill will carry trees of any kind, but it should be planted on the top with ever-green firs, running the planting of these round the south and upper sides, connecting it with the banks of the river in the glen ; and here I should suppose on the hill and in the glen on both sides, there would be upwards of 1200 acres of fine coppice land

that could be planted, which from its locality to sea carriage and good roads, supposing oak bark to keep only its present low price, when properly converted into oak coppice and cut in yearly hags or cuttings, say about 50 acres yearly, would bring annually to the proprietor not less than from seven to eight thousand pounds sterling, and that for all time coming, without any expense but the first enclosing and planting, which will be but a trifle. This is certainly well worth serious consideration, that by laying out a few hundred pounds of the rental for a very few years, say for eight or ten years only, on this and some other places, it would insure to the property from ten to fifteen thousand pounds of additional yearly income, from lands that are not bringing just now L.100 of annual rental to the property. This is equally valuable, and indeed more so, than buying as much more land to the estate, as no purchase of land could ever insure a rental of L.10 per acre, besides beautifying the country as well as the estate, and giving bread and clothing to many a poor labourer and his family.

No. XLVII.

Dargle Glen, Powerscourt, Ireland.

This being so conspicuous a place, and so much a place of resort, from the nobleman to the lowest mechanic, in the present state of the property, to cut and carve with it as a plantation of trees, would, I am much afraid, be treading too much upon sacred ground; one thing must be plain to every

one, that had the present trees upon the ground been attended to in time, they would have been much more valuable, ornamental, and praiseworthy. The trees have been allowed to remain by far too long and too close, and have lashed each other so much that very few of them have good tops, the generality of them are more like poles than trees.

To improve it as a wood, laying aside for a moment the idea of it as a place of public grandeur, admiration, and amusement, leaving always the trees on the sides of the walk untouched, select carefully the very best and most healthy of the trees, at or as near as can be thirty-six feet distant, tree from tree; mark all such as are to stand on the ground, dress them carefully in the roots for the growth, cut away the others, watch the young growths in every stage with the greatest attention, and rear up all the fine healthy shoots, thinning, pruning, and rearing them up early* to be a fine ornamental tree. In a very few years, many of the trees will be found dying, and gaps or blanks will be the consequence; but to take it in time in this way, a very few years only, (as from its well sheltered situation, the natural shoots will make great progress) say not exceeding ten, beautiful, healthy, and ornamental trees would be covering up the ground with underwood, which in this place would keep its foliage all winter and be infinitely delightful. This is the only method to insure a lasting crop of fine trees in this place, and to hand them down to generations yet unborn; or, secondly,

* In rearing a young natural shoot of oak, &c. if taken in time, it can be trained up to any shape, &c. See Forester's Guide. "Train up a child in the way he should, or is wanted to go, and when old he will not depart from it." This holds good in trees.

suppose another case, which will always keep up the look of it as at present, or nearly so; thin out to eighteen feet, tree from tree, taking care as aforesaid to select the worst of the trees, dressing up as aforesaid the stools of those cut for the growth, and rearing up always the fine shoots for trees from the young growths; but observe in this way the standard trees, being so close on the young shoots, they will neither grow so rapidly, nor be so healthy shoots. I for my part would prefer the first plan; but, thirdly, cut over every third tree as a pollard, taking the best of the trees for that purpose, in two or three years when these have begun to form and make beautiful tops, to give them room take away the tree doing them most injury, and the next year or so take the tree on the other side, &c. always to give it room and it will no doubt soon form a most beautiful top, and become a most ornamental tree. This last is the plan to beautify the place in three, or not exceeding five years, when fine ornamental trees may be obtained, but at a sacrifice of some valuable timber. The first is the most proper plan, and will secure the most healthy and permanent crop of fine trees. The whole rests as a matter of opinion and choice with the proprietor. To allow it to go on in its present state much longer will be ultimately to extirpate it, although many trees will come on, many more will die. I would give the preference to the first plan. What is said here will be found illustrative as to trees in many glens in the three kingdoms, where they may have been neglected as to the means of recovery.

No. XLVIII.

Nursery.

Where there is so much to be done in the way of planting, it would be of the greatest imaginable utility to establish on every estate a small nursery, not so much for rearing from the seed, as this is attended with considerable expense, but to buy in seedling plants from the seed bed, transplant them in it till they are ready to plant into the field or wood, where they can be kept short or long, to rear them to answer the purpose of every soil and situation where large or small plants may be required ; this will also prepare them for the situation, soil, and climate. Seedlings in ordinary years, unless there is an uncommon scarcity, can be bought at from 2s. to 4s. per thousand, average prices of all kinds ; this will at least be a saving of 20s. on the thousand of plants, and the little ground they occupy for one, two, or three years is comparatively nothing ; I should suppose one-fourth of an acre sufficient in the meantime, unless some extensive new plantations are to be made. From what I have already said as to the incalculable advantages to be derived from planting, it would be unnecessary to go much farther into the affair at present ; I cannot help wondering that some society or joint-stock company does not embark in a system of planting waste lands, especially in this country, (Ireland,) where excellent land for rearing timber can be got for a mere trifle, and labour so very cheap, and every thousand pounds laid out, would bring a return in twenty years of more than L.7000.

A company of this kind, termed, if you will, the Irish National Planting Company, would be worthy a British King to be at the head of it—of the Prince, the noblemen, the gentlemen, every lover of his country, and every lover of gain to be members thereof.

No. XLIX.

Improving Pasture Lands.

Another or second means of improving the waste lands, and bettering the condition of the poor in Ireland, besides that by planting, together with a third means of reclaiming the bog and mosses, &c. shortly to be noticed, which put together, would not leave any of the waste lands of that country unproductive. It is a well-known fact, that among the many grievances complained of by the poor inhabitants of Ireland at the present time, there is none more glaring than that of the want of clothing,* this is evident to the most superficial observer, on landing in that country, whether in the city, the village, or any part of the country. Nor is it in their body clothes only that the poor, or rather what may be termed generally speaking the working class in that kingdom, seem so miserable, but also in their bed-clothes, and in their uncomfortable cottages; every person that has travelled in Ireland, and has taken particular notice of the state of the poor within, as well as without doors, will assert the fact, that the want of clothing is of itself the cause of great distress among the lower orders of the people in that country. To remedy this

* It is a well authenticated fact, that it is no uncommon thing to see a poor person in Ireland exchanging clothes with a field scare-crow, that is, a thing dressed up with old clothes in the fields, to fright the birds from the crop.

great evil, I beg leave to suggest what appears to me best calculated to effect so desirable an object, and thereby to ameliorate the distress of the sufferers. To all who have the means of knowing the real state of Ireland, they will most readily allow that the great cause of the want of clothes of every description among the poor, is their inability to purchase either the cloth or the raw material; the wool at present produced in Ireland being of a good quality, and of course higher in price than what the poor people can afford to pay for, consequently they remain in many cases the pictures of misery. Now, were the mountainous parts of Ireland farmed after the manner practised in the Highland districts of Scotland, the inhabitants of Ireland might be clothed fully as comfortably as the lower orders of people in Scotland generally are. It is a well-known truth, that the labouring classes of people throughout the whole of Scotland make a decent appearance in their wearing-apparel, and have in their cottages plenty of comfortable blankets for themselves and families. This is chiefly owing to the abundance of wool, which at all times is easily and cheaply procured in every part of the country, oftentimes as low as from 5s. to 6s. per stone of 24 lib. This arises from the mountainous, and most rugged parts of the kingdom being stocked with numerous flocks of what is called Scotch black-faced sheep, which produces abundance both of wool and mutton, thereby enriching the country with food and clothing. Every labouring family in these parts of the country buy a little wool from the sheep-farmer, which the wife and younger branches card and spin. They procure a little alder, larch, rowan-tree, and other bushes, with which

they dye it different colours, they send it to the weaver, and have excellent clothes of their own manufacture, for all descriptions of apparel, and in which they appear at kirk and market equally well clothed, or at least equally well screened from the inclemency of the weather with their noble proprietor. I have myself wore cloth, and particularly stockings of this manufacture, that did not cost me one-fourth of the price, and far outstripped the wear of English cloth and stockings. The poor Irish labourer, and even many of the mechanics, go to market and buy second-hand, or old clothes; if they do not exactly fit, which is most likely, they go to pieces the first day's labour; thus they are ever in want and ever in rags. Many thousands never had a shoe on their feet, nor a coat on their backs made to fit them; only think of the poor pitiable figure they make dressed up in such rags, for so they may be called, before coming to such a market; think not that I speak hyperbolical, or out of disrespect? No, far from it. From the hospitable way I was received in all parts of Ireland, I love the Irish and I love their country; what I say is a notorious fact, and so much the more pity. Now what is the case in Scotland, might also be the case in Ireland, were the proprietors of mountainous lands in that country, to turn their attention to the stocking their hill-pasture with the very same kind of sheep that is now grazing upon all the mountains of Scotland; I recommend the Scotch black-faced sheep, not with a view to turn off any of the sheep the country is already possessed of, but I recommend that kind of sheep, as being the only domestic animal that will thrive well upon lofty mountains which are exposed to snow and

the winter storm, as many of them have been known to lie below the snow for eight or ten days and still survive and thrive afterwards. The most rugged mountains in Ireland, even those that are of little value to either proprietor or tenant at present, could, without much loss of time, be turned to advantage by pasturing with these kinds of sheep, and will be found the best means for clothing the poor of that country; nor is any extra labour requisite, except herding, and one man with a sagacious dog, will be found capable of attending to a thousand of these sheep; this is frequently the case in Scotland. Scotch ewe lambs of this kind could easily be exported from Argyleshire, the distance between that part of Scotland and Ireland being so very trifling. The very remotest and poorest islands of Scotland are now stocked with these profitable sheep, which greatly enrich the country, and have brought in a great extent of land which was formerly of little or no value, either to proprietor or tenant; so much so, that before this, many proprietors did not well know the bounds of their own ground. The Irish mountains have advantage over the Scotch both as to climate and rich natural grass, which are far superior to the coarse grass and cold climate of Scotland; so that if any considerable number of lambs were imported into Ireland, they would in a few years multiply to that degree, that wool in that country would soon be both as plenty and cheap as in Scotland. As one foot of pasture ground produces more natural grass than three in Scotland, so that the poor inhabitants of Ireland would soon be equally well clothed with the Scotch people. I am well aware that in many parts of Ireland great numbers

of horned cattle are reared annually and sent across the Channel for the English markets ; but that does not in any way prove that more sheep cannot be reared throughout Ireland, without lessening the rearing of horned cattle ; the reverse will be found to be the case. I speak from personal knowledge, when I say the worst mountain in any part of Ireland upon which black cattle cannot feed, would be found sufficient pasturage for sheep Scotch bred, only let them be allowed in the winter season, when the snow falls very deep, to come down about the foot of the mountain, as is commonly done in Scotland during the storm. I am also aware that these sheep will find pasture and thrive among rocks and on parts of the mountains, when even the native Irish sheep will not. The Scotch black-faced sheep is well known to forage for their own support in all seasons of the year, without any other feeding than the very coarsest of grass, and heath produced on bare rocky mountains. If therefore such sheep were brought to the worst lands in any part of Ireland, they would be found most advantageous to the general interests of the country. No scheme can be devised to improve the mountainous parts of a country, and which requires so little capital, or even so little labour in the execution of the whole project, as that which I have proposed. In order to convince the proprietors of mountainous grounds in Ireland of the propriety of turning their attention to their own interests, and to the general good of the country, in stocking their mountains in the manner proposed, I beg to observe the rapid progress made in all the Highland counties in Scotland since the middle of last century. At that time, and for many years afterwards, there was not a single

black-faced sheep known in any of the counties north of the friths of Forth and Clyde. Some small white-faced sheep and goats, with some few horned cattle of an inferior size, and little horses, were all that the Highland counties produced in those times, and from such stock the rents could be but trifling. The first of these black-faced sheep were introduced into the counties of Dunbarton and Argyle, in the year 1757, by a shepherd from the south of Scotland, named Thomas Harkness, who came to, and settled in the district of Cowal, Argyleshire, who then only brought a small flock of this kind of sheep. This man proved careful and industrious, and was of course encouraged by the proprietors of land. He added to his flocks to that degree, that he was enabled to purchase free lands in that same division of Cowal, to the amount of L.16,000; this is a very hilly and small part of the county of Argyle, and is much exposed to storms in winter, particularly snow; since the above time, this district alone contains and grazes no fewer than 78,000 of these sheep, a good proof that they have been found profitable.

It will be seen by an article in a recent number of the Quarterly Journal of Agriculture of the Highland Society of Scotland, published by Mr. Blackwood, Edinburgh, that the improving the breed of sheep to produce finer wool has been attended with serious loss to the sheep farmer, as the sheep is rendered more tender in the constitution, and not near so hardy and healthy as the old breed.

NEW, EASY, CHEAP, EFFECTUAL,
AND
PROFITABLE METHOD
OF DRAINING AND IMPROVING,
BY CROPPING, &c.

THE BOGS, FENS, AND MARSHES, OF IRELAND.

THE draining of Bogs, &c. every where, but particularly in Ireland, has occupied the pen and the judgment of almost all classes of society and rank in life; for many years many volumes have been written on the subject, and plans proposed, but all of them have had insurmountable barriers to encounter. To many of such bogs no free level can be got, without driving through hills and other proprietors' property, for miles, and such like difficulties, which would incur such an expense as is altogether a prohibition; it is to obviate these insurmountable difficulties that I now come forward, with this, my novel scheme, but, although novelty may be wrote on its forehead, yet it is both practical and practicable. To those who have read, or are the least acquainted with what I have already wrote, I beg to say this much for myself, that I never have yet brought forward to the public any new scheme, without first having so far put it into practice, as to put its utility beyond the power of fair contradiction. I most readily admit that I have tried many plans and

schemes that have failed, which perhaps made me go supperless to bed at times, when I might have been in opulence, but these plans and schemes never were intruded on the public until I could come boldly forward with a stubborn fact as a proof, and say, that such is an improvement that cannot be denied, the practicability and utility of which I have fairly tried, and am ready to prove; such is the case with my system and method of draining bogs and marshes. I have not brought it forward till I had proved it, and I trust, for their own benefit, the Lords of the soil will read it with unjaundiced eyes, and give it an impartial consideration; it is so plain, simple, and easy to be understood, that he who runs may read, and scepticism put to the blush. I am well aware that any new scheme introduced to notice is too apt to be treated with neglect, or considered as visionary; few read it, and still fewer will take the trouble of putting it to the test of experiment; besides, books which contribute merely to amusement, and save the trouble of thought, is better fitted to the taste of the present age. But to return; it is well known to all, that wherever there is a free level or descent there is no difficulty in draining, but it is also known, that in many cases, to obtain this level or descent, it would cost more than the purchase or value of the land, but wherever a descent or level can be obtained at no extraordinary expense, it is a permanent and sure plan. It is also a well known fact, that where there is a gravelly and sandy bottom, all such bogs, fens, marshes, or mosses can be drained, by boring or pitting; in some cases two or three bores will be sufficient to drain an acre; in other cases, where the ground is covered, or almost so, with sur-

face water, it will take two or three, and oftentimes four pits to drain each acre; this, however, where it can be done, is also a sure and cheap plan. But it is where it is altogether impossible to get any of these plans put in execution that I propose to drain the bogs, at little expense, and in such a way and on such a plan as will bring an immediate return of outlay to the proprietors of such lands. To come then to the plan which I propose, viz., to drain boggy, fenny, and marshy lands, (within themselves) where it is impossible to drain either by descent, free, level, or pitting, without prohibitory expense. First, I propose to plant with larch firs, one-third part of all such lands, and to crop the other two-thirds. The larch firs are to serve three most important purposes,—first, to absorb by suction, and evaporate the water,—second, to provide manure for the corn lands—third, to shelter and warm the corn or cropping lands, and I may add a fourth purpose for profit. As I said at the outset, when I recommend and dictate, it is solely from experience, but before entering on the method and explanation, allow me to give a proof or two, the result of experience. I have known a piece of boggy land, tending to moss, containing upwards of 20 acres, whereon a bird could not find rest for the sole of its foot, most effectually drained by the proposed method in a very few years, and in twenty years producing trees of larch and spruce firs, containing twenty solid feet of timber, nearly a ton of gross weight, and so completely drained, that a horse could go on the ground and drag off the tree when cut, and to this there was no outlet to the water. I might give numerous instances of this kind. I knew a marsh where willow and poplar

trees were planted twenty-two years ago, when for want of open ditches at the sides of the fields, their roots were covered with standing water, for six months of the year for the first ten years after planting, but still these trees, as they increased in size, dried the ground for a number of yards round their roots, and some of the trees were sold last year at L.3, 13s. per tree. It is a known fact, that to put the roots of a willow, a poplar, a larch, a spruce, or Scotch fir tree, (say plant) into a bottle with pure water, with the top out, sealing up the mouth to keep out the air, that these and all other soft wood trees will grow and thrive till they absorb all the water. It has been proved and is proveable, that an acre of soft wood trees, larch, &c. planted at three feet, plant from plant, will absorb from eight to ten thousand gallons of water, if all healthy and thriving the second year, after being planted, and an extra quantity always annually, as they increase in size, this supposing them kept nearly dry on the surface, and yet these kinds of trees will grow and thrive where the tenth part of that moisture is not to be found, but in these cases, they inhale their moisture from the air, and it descends from the foliage by the bark to the roots. To return to the method of draining, let us suppose we are to drain 100 acres of bog, taking a finite for an indefinite number; the first thing to be found out is the level of the surface, and to whichever end or part of the ground there is a descent, to this place the drains are to be made to lead the water; and supposing the ground to be exceedingly wet, so as not to be drainable by planting alone, at the lowest decending spot, let there be five acres for every hundred marked out,

dig out these five acres, to a deepness of four or five feet, as it may be supposed the quantity of water may require; what is thus taken out for the pond or sheet of water must be laid on the ridges to be converted and improved into corn land. The whole ground, say the 100 acres, more or less, must then be divided into equal proportions of sixty feet each, and betwixt each ridge thus divided, cast a ditch four feet wide at the top, one foot, 6 inches, at the bottom, and four feet deep; all those leading into the five acre loch, plant up with larch firs, at three feet, plant from plant, every third ridge, and the other two ridges to be converted into corn land. For the first ten years, a number of spruce firs may be planted and reared amongst the larch, as they are excellent for draining. If the bog or marsh to be drained, is almost a standing marsh of water, it may be necessary to have a ditch in the middle of the two corn ridges, but these may be of smaller dimensions than the main ones, and have cross-cut drains leading into the main ones. As the soil on such lands is generally good, the larch firs will take root the first year and continue growing, so that after the second year's growth, unless the ground has been wholly covered with water, they will have, with the help of the pond, so far drained the two parts of land for cropping, that they may now be sown with corn. Thus, it will be perceivable I have been taking a view of and draining the very worst description of these bogs and marshes, but in ten cases out of twelve, all such land can be drained by planting alone, that is to say, by ditching and planting, as aforesaid, every third ridge; to be more plain, always planting one third, and cropping two-thirds of all such land, attending strictly to the me-

thod prescribed. In a very great many portions of such lands much smaller ditches will be perfectly sufficient, but this any person the least acquainted with draining, when viewing the ground, will readily discover.

This brings us forward to consider the expense and method of cropping, manuring, rental, or income.

Expense, Method of Cropping, Manuring, Rental, or Income.

It is impossible for any person to give a just or accurate amount of the expense, unless he was upon the ground, and describing each particular spot or field. Where it is necessary to have a pond to contain a quantity of water;—to convert five acres of every hundred into a pond, will cost about L.40. The ditching as in the plan proposed, L.1, 15s. per acre, say for 100 acres, L.215, and the planting of 33 acres with larch firs, plants and all L.50;—see the method of planting this kind of land afterwards explained in Danhail Moss;—this is in all, L.265, but in Ireland it can be done for L.200 easily, for the which I will quickly provide a fund; observe this is taking the very worst, most desperate, and most expensive case of boggy land into view, but in 10 cases out of 12 we may throw away the pond with its expense, of course the whole may be drained and planted, for about L.225 sterling, which is a dead sum on every 100 acres. In cropping the year after the draining and planting has been finished, the whole corn land must be dug over by the spade, as it is not to be supposed that horses can go on it for some years, at soonest four

years, and if very wet, it may be six years. In digging over the surface, the soil thrown out of the ditches must be mixed in with the surface soil turned over by the spade; care at this time should be taken in digging and mixing up the soils, to keep the ridges highest in the middle, so as the wet may naturally seek to the drains. I have known two men dig over and prepare for the seed a Scotch acre and three roods in a week, which is nearly two imperial acres, but to cover the expense fully, I shall suppose two men dig over and prepares for the seed one acre in a week, and these men have 18s. per week, say 9s. each, 1s. 6d. per day. In Ireland labourers work for little more than the half of that, but my maxim is, live and let live. The first year's digging or preparing for the seed, will cost a little more in breaking up the turfs, but I consider 18s. per acre sufficient on an average of years. Land of this kind we are now speaking of, in the greater part of these bogs is excellent, and will carry any kind of crop. Now suppose for the first three years we take a crop first of wheat, second barley, and third oats, the average prices of these, suppose wheat 30s., barley 20s., and oats 15s. per boll, the average will be rather above, but let us keep it under and call it 20s. per boll, now I shall come so low as strike the average crop on each acre, at ten bolls for the first three years, here is no less than ten pounds produce from every acre, as the straw is generally allowed to pay the expense of cutting down, gathering in, and thrashing out. There is not the least doubt of this produce for the first three years. Here we have L.1000 sterling for the yearly produce of 100 acres, in all in three years L.3000, and we have an outlay for draining and planting, &c., taking

the very largest sum; and the most difficult to drain L.265, add one year's interest at 5 percent, is L.278, 5s.; now for labour we have 18s. per acre, which for 100 acres for three years, taken yearly, is L.270, add for seed according to the average of the grain already stated, L.1 per acre, which is for three years, L.300 reckoned at one boll for each acre, which will be found quite sufficient; this making in all, draining seed and labour for 100 acres for three years, the sum of L.848, 5s.; now we have the produce of 100 acres for three years L.3000, from which deduct L.818, 5s., and we have the sum of L.2181, 15s.; but from this sum we must also deduct, taking always the most expensive outlay for draining, &c., for five acres of pond at L.10 per acre, L.150, and deduct for 33 acres of planting for three years at L.10, is L.990, which together is L.1140, which deducted from L.2181, 15s., leaves a balance of clear profit from the produce of 100 acres in three years, of L.1041, 15s. after draining and improving, and paying seed and labour, and bringing into fine arable land 100 acres, for which almost nothing was got formerly; here is no less than upwards of L.8 sterling per acre of annual rental, after all the expense of improving and outlay, &c., is paid the very first year. Where is the avaricious mind that would not be satisfied with such a profit as this? The proprietor brings in his waste lands, bogs and marshes in three years, and saves to himself upwards of L.1000 sterling on every hundred acres, which before was paying him nothing. And he has now brought it into good cropable land, and improved it so that he can now let it to a tenant at a yearly rental of L.4 per acre, and his tenants of every 100 acres enabled to, and pay regularly their rents, live

respectable and respected, educate their families and die wealthy; but more of this anon.

*Manuring and Keeping in a Productive State
such Lands.*

I must lay the foundation of manuring and keeping in a productive state such lands, by explaining my four propositions, as laid down in planting a third part of such lands with larch firs. The reader will recollect these were first to absorb by suction and evaporate the moisture or water. It is a well known fact in forestry, or by those who are acquainted and accustomed to the rearing of trees, that the more sap or moisture, soft wood trees have, if not flooded over with water, the faster they grow. It is also a well authenticated fact, that if the subsoil is good and the roots nearly dry, however wet below, the spruce, the silver, the Scotch and larch firs will grow, thrive, and come to maturity, and of the hardwood tribe, all kinds of willow, and poplar, and even the ash and oak in very moist and wet places will come to maturity. But I aver, without the least fear of contradiction, that an acre of larch or spruce firs planted at 3 feet plant from plant (or say they may be put in at 2 feet in extremely wet places,) will drain by absorbing the moisture, the very wettest land where the soil is good, where the surface can be dried according to our plan to plant them, and where there is no run of water from hill or high lands around altogether to inundate and cover the whole surface. The water will be gradually subsiding as the plantation of trees increase in size, and when the

trees arrives at a height of from twelve to sixteen feet, it is most likely the planting will have drained the ditches dry or nearly so. When this is the case, the ditches may be covered over, which can be cheaply done by using the cuttings of small larch firs laid across the ditches about half way down, keeping them always open about two feet from the bottom, and covered all over on the surface when the whole can be ploughed over and cropped, the wood in the drains will last 100 years, and there will be always plenty got from the thinning of the larch planting for this purpose.

Second, The second purpose the larch fir planting is to serve is that of manure for the corn lands. It is a well authenticated fact, and known now to the most of agriculturists, that the foliage of the larch firs is excellent manure; even the branches, if allowed to lie and rot on the ground, will enrich it and make it carry any kind of crop, after the land has been so far drained that it can be laid in crop; such land as is generally in the marshes, will carry three crops without any manure, and for the first years in many cases, four and five crops. What I would propose and I think the best method for keeping the ground always in good heart, is to take three crops, and allow it to rest every fourth year, and clear out the bottom of the ditches, and mix up with the larch foliage and lay it on the sillon or ridges; the last or third year's crop should be cut high, so as to leave a good long stubble, which will also assist greatly to manure the ground. After a very few years, the larch foliage will be found sufficient to make a compost for manuring the whole corn land. After the first ten or twelve years, the ground, unless in extremely wet cases, will be so

dried as to admit of horses on it, both to plough and dung it, when it may be done to pleasure.

Third, To shelter and warm the cropping lands, it is well known to all, that wherever there are plantations of any kind, they wonderfully shelter and warm the fields, so much so, that when in pasture, the cattle thrives much better, the grass or pasture is more abundant and nourishing, and the crop more luxuriant. The beneficial effects of this will be most wonderfully and advantageously felt where the stripes of planting are so close to each other, as will be the case in the draining system, and where the ground is so cold by being wet in the bottom by the warming influences of the planting.

Fourth, For profit I might give hundreds of incontrovertible proofs of this, many are given in this same work, but for a complete explanation of this, I need only refer my readers to the subsequent No. Danhail Moss, land much worse and more wet than thousands of acres we are now speaking of, and that I have seen in Ireland, and it will be seen there that at eight years old the plantation begins to pay and will for ever after pay an annual rent of at the very least L.7, 10s. per acre. See the profits of planting of all descriptions fully, practically and experimentally explained and enlarged on in my Forester's Guide and Profitable Planter, as also in this volume.

I have no doubt, after a fair trial, the possibility and utility of this system of draining will be fully appreciated by the lords of the soil in Ireland and elsewhere; and I would advise, that the proprietors themselves first set the example. They see plainly they will have not only all their outlay realized, but an immense profit in three years, after which they

can farm it out. I am well aware, from what I have myself seen in Ireland, that there are thousands of acres of excellent land, which can be at once easily drained and cultivated in this way, land equal in quality to much of our best carse land in Scotland, and will carry equal crops, which generally let at L.5 or L.6 per acre; and the land I am now speaking of in Ireland is equally good, and can be laboured at much less expense. But I shall even condescend to come so low, as live and let live is my maxim, as to say, after the proprietors have drained it, they let it at L.4 per acre, so as the tenants can pay their rent regularly, and live by it. Here the proprietor will have for 67 acres out of every 100, L.268 yearly rental, and after the first ten years, as much per acre and more for his planting, so that he will have a regular and secure income of L.400 sterling for every 100 acres of land, not now paying him L.40 annually. I am well aware, that a great many proprietors in Ireland have many hundreds of acres of this kind of land, and some have thousands, which land of itself would be a handsome fortune. I hope they will take the hint and set about this improvement with spirit and life. If any of them doubt, try it on thirty acres first; say ten acres of planting, and twenty of cropping, and if they give it fair play, I am bold to aver they will be at once satisfied with the plan. But, to do it justice, select a place where the planting will have no more water to absorb than what is within the bounds of the thirty acres; and if this is attended to I will insure them of success.

I am well aware, and perfectly convinced, that if this plan of improving the waste lands of Ireland,

taken in connexion with my other plans of improvement on bare, rocky soils, &c. described in this work, see Leackenderry Hill, No. XLVI., with many others, I say I am perfectly convinced, when these improvements are set on foot, Ireland will soon be the richest and most independent of the three British nations, and the noblemen, the gentlemen, and above all, the farmer and the labourer, will, in their own sphere, be equally benefited and enriched.

Should the lords of the soil (as it must begin with them) turn a deaf ear to this improvement, I may say to them in the language of Holy Writ, what the great Jehovah said to Israel of old, Ireland is joined to idols and indolence, let her alone. The poor labourer of five feet stature will still starve for want of food, and wear the old casting clothes of the man of six feet. But I hope better things of the lords of the soil of Ireland. When once these improvements are set about with spirit and life, it will be the best emancipation, emigration, and corn bill, Ireland ever saw or heard of.

To give one striking example amongst many, there is a farmer on an estate in Ayrshire, who has some small spots of boggy land on his farm, tending a good deal to moss, and I may observe by the way, that this land is as inferior to the most of the lands in Ireland, as cast iron is to gold; there being no outlet or descent for the water, the farmer drained by deep ditches, and threw it up into what is commonly called layse beds, say ridges, about fifteen feet broad; he trenched it over, and laboured it by manual labourers, and he had fifteen bolls of wheat on an acre, and ten or eleven bolls of oats. He has had it in crop for many years, and still going on labouring and cropping in the same

way. As the places are but small here, they will not admit of planting. When he has to manure, it has also to be carried to the field by men, still it pays him better than the best land on his farm; indeed, there is no other that he has nearly the same produce from. There are hundreds of acres managed in this way throughout the Highlands of Scotland, and produce 80 bolls of potatoes in each acre, and the ditches always full of water.

The vast quantity of different kinds of waste and unproductive lands, as has already been shown in another part of this work, and the means of cheaply and profitably improving and reclaiming all such, by planting what cannot be pastured or cropped; by pasturing what cannot be cropped; and, by draining and cropping the bogs, &c. has been, I trust, clearly made out beyond the possibility of fair and impartial contradiction. That there are few, or I may almost say, no proprietor in Ireland of any extent, but who has less or more of some of these kinds of wastes to improve; and were each of them, on their respective properties, to set about their improvement, this would be the best poor laws and emigration laws that could be introduced into Ireland, as it would at once give employment to the labourers, and raise their wages to what would enable every labourer to feed and clothe his own family and poor friends, as no one would see their father or mother begging if they had the means of keeping them; so that, if the labourers had work at a fair wage, there would be, comparatively speaking, but very few on charity. A man, with a wife and eight children, and only earning 8d. or 9d. a-day, (as is the case in Ireland) must be starved

both for food and clothing, but give them 1s. 4d. and 1s. 6d. per day, as the work will afford it, and Ireland is at once finally emancipated. The lords of the soil are enriched; the labourer and his family are fed, and clothed with cloth from the merchant's shop, instead of old rags; the manufacturer and merchant has each in their turn more trade, and all will be contented and happy without poor laws, without emigration, and without starvation in soul and body. Government, or some joint-stock company, should make the experiment on an extensive scale, and I am bold to aver, they will soon have profits to their satisfaction; still, I cannot help saying, that, as has been shown, the thing is so easily done, and so soon brought to pay every outlay, that the proprietors of all such lands should themselves be roused from their lethargy and indolence, and set immediately about the grand work. It is well known, and will be argued, that plantations keep the ground wet and damp when they grow; this must be the case, because the sun does not get in amongst the trees to dry the surface, and this is the very life of the plantation; if this was not the case, the trees would die for want of moisture and nourishment. Give a plantation of soft wood trees a dry surface, and plenty of moisture and sap below or around them, and they will grow rapidly. I need hardly mention, that where it is necessary to have a pond, it must be at least one foot deeper than the ditch, and the ditch must be first made to contain the water till the pond is cast out, but this will be easily secured, as the circumstances of the case may require, by any one the least acquainted with such work.

No. L.

PLANTING.

The following refer to some Farms in a part of the country exceedingly bare for many miles, in Berwickshire.

It will be at once seen from what I have already said, that all the blank ground within the present boundaries as already described, should be planted up. The ground occupied by these clusters or lots of wood, and the line of roads by which the timber and bark has to be removed, cannot be planted up till spring 1828, after the wood and barks are all removed; but the proposed enclosures should be immediately made, and the blanks betwixt these hags planted up, and all new ground, first spring; as the natural growths from the cut stools will grow much faster than plants will do. I need hardly observe, that the whole of these blanks should be filled up with oaks; and where the rocks are very near the surface, oak acorns may be put in; converting the whole into a natural oak coppice wood; and if attended to after the first cutting, it will pay an annual rent of at least L.7 sterling per acre, and that without any expense for time to come, but keeping good the fences. I may here observe, although a little out of the way, that nothing would ever pay on this property better, nor could any thing be more advantageous to the farms, besides ornamenting the whole country, clothing the naked scenery, and affording excellent shelter for the cattle and sheep,—to plant the

whole of the bank, from the ravine down from the shepherd's house already noticed, to the stone dike running down to the Berwick road on — farm, that is to say, carrying the fence from the upper corner of the new dike at the east end of the last lot, to the aforesaid dike on — farm, running up from the public road; this would only take in land not fit for carrying any other kind of crop, and the whole would carry excellent wood, either to rear up to maturity as standing timber trees, or to cut regularly as a coppice natural wood, besides beautifying the whole country. It would not only be profitable to the proprietor as a crop, but also add greatly to the value of the property; besides affording excellent shelter to cattle and sheep on these farms, which is so much wanted on these bare looking farms. Were this plan to be adopted, I would advise that all along the top of the bank, between east and west, be planted a double triangular row of spruce and Scotch firs, which will always show as a plantation of timber trees, particularly in winter, and will warm and shelter the whole property; as far as they go, the spruce and Scotch firs should be planted alternately at four feet distant, plant from plant, and regularly thinned out to stand, at not more than twelve feet when finished, and topped down when too tall. I may also add, that the ground proposed from the easter lot, sweeping north-east, facing the public road, should be planted and reared up as standing timber trees; and here for this purpose, should be planted the oak, Spanish chestnut, Scotch elm, ash, plane, spruce, silver and Scotch fir alternately, to give variety to its look. Permit me here to observe by the way, that were a few belts, stripes,

or clumps of planting properly laid out and reared on these farms, so far from taking off the yearly rental, that it would actually add to it by affording shelter for cattle, &c., and add fifty per cent. of intrinsic value, to the property. I have marked off, at the same time valued, a few reserve trees, so that they may be either sold with the lots, or at any time after, as the proprietor then may think proper; these are left more with a view to show what was on the ground at cutting time, than to add to the value of next cutting, as many of them will never be much better, and may be cut away after the other trees come up, to cover the bare face of the bank. From the manner that these trees are marked, along the top of the bank, it will show that it was more with a view to improve the place than to make money of it, that the present proprietor cut the woods. The value of each of these reserve trees are given, each by themselves, so that either the whole or any number may be taken out at any time, and their value known; a list of these trees, with the value of each is given, with this is also sent the articles of sale with regard to cutting, &c.

No. LL.

OLD WOOD PARK,

ESTATE OF LIVINGSTON, LINLITHGOWSHIRE,
Surveyed in 1823, before the publication of the Second Edition of the Forester's Guide. This is in a very cold bare country.

From the nature of the soil of this field, being a cold till bottom, I am of opinion that it will not rear

up trees to a great age, or full maturity; but I am of opinion, that it is well adapted, both as to soil and situation, for a natural oak coppice wood; and as every foot of the ground in the field will carry oaks for that purpose, and from its locality to a bark market; if properly attended to, it will pay at the rate of £45 sterling per acre of annual rent, allowing the oak bark to keep its present reduced price. The method I would advise for planting, &c. is, after having cut an open drain in the middle, from south-west to north-east, (say two feet six inches wide at the top, one foot at the bottom, and two feet deep,) then run a plough through every furrow, as it now stands in ridges, to the depth of seven inches at least, leaving them open; plant the hollow sheltered places with oaks alone, at a distance of six feet, plant from plant, and on the level part of the field, oaks at eight feet, putting in a plant of larch fir betwixt each; these larches to be allowed to remain only for six, or not exceeding seven years, in order, not so much to shelter the oaks, as to make and enrich the soil for them afterwards, and then the larches to be all cut out; the whole of the trees of every description, on the west side, within the field, to be cut down, and the stools of the oak and ash properly dressed up for the growth;—the stools of the birch to be extirpated. The ash, although of bad quality just now, the natural shoots will then be quite a different quality, and nearly equally profitable as oak in a natural coppice wood; besides, the oak and ash on this part of the field will fill up a great part of the ground, without being at the expense of a single plant, by layering from the young shoots, a plan though new, (and opposed by the nur-

serymen,) I have practised with the greatest success, and to great advantage, for these some years back. The method is by layering down on all sides where there is blank ground, some of the young shoots from the old stools, and leading them out, year after year, till they fill up almost any quantity of blank ground, and every year the layer will make a push of two, three and sometimes four feet in one season; being more than an oak will do from the plant in five years, and far less risk of their misgiving than from the plant. The method of planting the level part of this, or of any other field, is by running them in angular lines from the way the trees are most exposed to the weather, (such as from the S. W.) as for a standing plantation. When planted in this way, the trees can be thinned out to great advantage, in a triangular form, so as never to lash each other with the wind, and at the same time where shelter is required for the adjoining fields, which is much wanted on this estate; as in this way, by paying proper attention to the thinning, there is no way of looking into the plantation, but trees strike the eye, without seeing through it; nor are the trees, when thinned out, so apt to be blown down. This way of planting is also of equal advantage in a natural wood, as when the stools fail in this triangular form, it is much easier getting the stools to occupy new ground by layering, and also keeping a proper crop upon the ground for time coming. This method of triangular planting will be attended with still greater advantage in narrow stripes, and belts of planting where they are intended chiefly for ornament and shelter, as in this case the trees will stand the weather far better, and afford more shelter.

No. LII.

Stripes and Belts in a very bleak bare part of the country.

The stripes and belts of planting on this estate, are for the most part in a very rapid state of decay, and if not remedied soon, will be nearly extirpated, and others will show great gaps in them. One thing much against them is, many of them have been too narrow at first, and being totally neglected when young, and having been pruned in the place of being thinned, they have for the most part been reared up more like poles than trees, and great numbers of them never will be proper trees, either for shelter or ornament, the very thing they are altogether required for on the estate. Stripes or belts of planting for this purpose, particularly where the ground is cold and the country bare, and embellishment and shelter the only object to be kept in view, should never be planted less than 120 feet broad, so as 4 or 5 trees may be reared in the breadth, to maturity, at proper distances, and so as underwood may be reared up beneath them when large trees, which will not only afford excellent shelter for game, but be very profitable, as it can be regularly cut every twenty years; besides underwood is particularly beneficial to the growth and health of trees; in stripes and belts of this kind it keeps the soil moist and affords more shelter. Some of these stripes which consisted wholly of firs, and are rapidly decaying, it would be better to cut out altogether and plant them anew. Others of them, where mostly hardwood trees, and where some of them are likely to live, and maintain the re-

spectability of the look of the stripe; for some years, such trees should be carefully selected and marked off to stand, and the whole of the polish and dwarfish trees to be cut and immediately disposed of, and the stools of all the oak, ash, elm, and plane trees properly dressed up for the growth, so as to rear up either for standing trees to supply the place of those taken out, or to convert into coppice for underwood. But where none of these kinds of trees are, it would be proper to put in oak and Spanish chesnut plants; but where these kinds are, although only one in number, the whole breadth of the stripe may be filled up by layering as aforesaid, without the expense of planting. By a careful attention to this, the stripes and belts may, in the course of a very few years, be brought into a proper state. Trees to stand in belts of this kind should never be pruned after they are above six feet high, and thinned out before they exceed sixteen feet, to proper distances, in order to give them room to branch out.

No. LIII.

Same kind of Belts and Stripes on a different Estate in another part of the Country.

At the time the belts of planting we are now among were laid off and planted, say upwards of sixty years ago, it was customary with professional men, with a view to the saving of land, to lay them off very narrow in the belts and stripes, and equally circumscribed in the size of the clumps, although their very design was to give clothing, screen, shelter, and ornament to a bare, bleak, and naked country; and the

expense of enclosing narrow belts and stripes the same as that of enclosing broad ones. Also, a very few years experience must have convinced them of the destructive impropriety of such conduct; still it has been persisted in till within these few years, when in almost every quarter of the country the most miserable and melancholy picture of such plantations spoke more than volumes the absurdity of such procedure; and I am sorry to say the present is also a stubborn proof. All stripes and belts of planting of this kind, to serve the purpose, should not be less than from 35 to 40 yards broad, and round or oval clumps at least 50 yards in diameter. Every thing possible should be done to recover and keep up the remaining trees in these belts, &c. To effect this, all the polish, dwarfish, overtopped, and unhealthy trees should be cut out, and their stools dressed up for rearing up other trees from, or as underwood; all such trees should be very carefully selected and marked off. Wherever there are blanks, plants of various kinds of trees should be put in to fill up; the kinds to be put in should be chiefly oak, Spanish chesnut, Scotch elm, plane, ash, Scotch and spruce firs alternately; a proper attention in cutting and filling up as above, would amazingly improve the value, the look, and keep up these belts, &c. which, I am sorry to say, in many places, are falling into decay; where the fences are out of repair, and where the expense of enclosing the whole would cost too much to protect a few trees; all such may be cheaply and permanently done, by using my portable paling (*see Forester's Guide,*) in enclosing them singly till they are out of the reach of cattle.

No one need be at any loss to discover the purpose which it was intended these stripes and belts were to

active, and although they abound chiefly in beech, still beech is far from being an unornamental tree, and may be, with advantage, reared as such, although they are by far too numerous here. In many parts and sides of these stripes, there has at one time been a great many limes, which is a most particularly beautiful and suitable tree for this place, as ornament; the most of these limes has been unfortunately cut down, but for what purpose I am altogether at a loss to discover; the cutting of these limes was a most untoward event for the look of these stripes, as these limes, being mixed up with the beech, it made a most beautiful border.

A great many of the roots of these limes, notwithstanding the haggled way in which they have been cut, are sending out fine new shoots, which may profitably, and with great propriety, be reared up into trees, to fill once more the conspicuousness they once did, and always should occupy in these stripes. The whole of these stools, or young natural growths of lime, should be immediately, without one moment's loss of time, gone over, and thin away the rubbish, leaving two or three shoots on every stool where there is room to rear them up as trees; and wherever there is a beech (as there is by far too many of this kind), likely to overtop or injure the limes, it should be cut down, giving always a preference where it can be had, to be reared up as a standel outside tree; and on no pretence whatever should the lime trees again be cut down. Observe carefully to leave the healthy and promising shoots of the limes; they are sending up most beautiful growths, so that if a skilful selection is made, many valuable and most beautiful ornamental timber trees will be got reared up from them. For the proper method of convert-

ing natural shoots into standing timber trees, see Forester's Guide, second edition.

The whole of these stripes should be immediately planted full of trees, but in a manner perfectly different from that which has been going on of late; that is, by filling up the ground in these stripes promiscuously with all kinds of trees, without any regard to putting in a proper tree to fill up the blanks, where it is most necessary and requisite that a proper long lived ornamental tree, to be reared up to perpetuity, should stand to fill up the blank; without a due regard to this, the stripes will be continually filling up and never full. It is a matter of no importance whatever, how the spruce firs, &c. are put in for underwood, of which these stripes should always be full; but it is of the greatest imaginable importance, and the very life, prosperity, recovery, and salvation of these neglected and lost sight of stripes, to the putting in a proper selection of standel trees, that will be the most ornamental and long lived trees, to fill up the blanks, and renew the decayed appearance of these stripes. To effect this purpose, plant in all the blanks in the outside rows, plane, lime, and Scotch firs alternately; let these (together with such of the beech as is already on the ground worth the leaving as a standel tree,) be put in at distances of 12 feet tree from tree (including the beech,) lengthways, and in the interior of these stripes, a standel tree of oak, Spanish chesnut, Scotch and spruce firs alternately in the gap in the centre of the 12 feet outside trees, at 8 or 10 feet, if it can be obtained, in the wideness of the stripes from the outside trees, or measured from the inside of the fence, supposing the outside trees close on the fence. In this case, the standel trees will always stand in a

triangular way across the stripe, so that no storm will penetrate or injure them; and the standing trees will have always plenty of room, and yet the stripe appear always over full. The standel inside trees may be shifted a few inches, either one way or other, to save the private walk in the centre of the stripe. The spruce fir for underwood, may be planted at distances of six feet.

Observe, that whatever of the natural shoots of the times are to be reared up for trees in the outside, these are to be taken into account of standing trees; but wherever there is an unthrifty or unsightly beech, put in the standel plant to supply its place, and when it comes up to have the appearance of a tree, cut away the unthrifty beech or other tree. By a careful attention to this method, and none other, in a very few years these narrow, decrepid, broken down, and disgraceful looking stripes, will beam forth in gorgeous garments, fringed with ermine, summer and winter.

If allowed to remain much longer in their present state, they will soon be extirpated.

N^o. LIV.

Young Plantation.

From the light and shallowness of the soil, together with the exposure of the plantation, I am of opinion it will not rear timber trees to maturity, particularly the larch fir, which will grow pretty well for the first twenty years or thereby, till they arrive at a height of about twenty feet; when the tops will most likely give way. I am of opinion, that the only trees that will come to maturity here, will be the

hardy oak, the plane, and the Scotch elm, even these will grow very slow, and be a long time before they come to perfection as timber trees. I would recommend as the most profitable for the estate, that this plantation be wholly filled up with oaks, and converted into a natural oak coppice; to effect this, put in plants of oak at eight feet distant, plant from plant, amongst the firs; the plants to be strong well-rooted plants, not less than three years transplanted from the seed-bed, and then properly pitted in the ground, and cut over close by the surface the second spring after being put in; the blanks annually filled up with oaks; a belt of firs, &c. may be left round the outsides, say about thirty yards wide; after the oak plants, either by cuttings or otherwise, arrive at a height of from six to eight feet, the whole of the firs in the interior of the plantation to be cut out. In fifteen years after the whole has been filled up with oak, the whole of the oaks may be cut over; this cutting may only bring about L.15 per acre for wood and bark; but it will be hastening the whole forward for another more profitable cutting, which will bring at least three times that sum per acre, at the same age; but I would advise the next cutting to be at twenty years old, dividing it into four hags or yearly cuttings, which should bring in at least L.2000 every hag or cutting, for time coming. It may be advisable in some places of this plantation, where the larch firs appear to be the most predominant, to allow them to come up to the age of fifteen years with the oak, at which age it will be seen what sort of trees they are likely to be; and should it be necessary to cut them at this age, the bark will be of good quality, and will pay as a crop, though not near so well as the oak.

No. LV.

Old Coppice.

This bank of coppice is upwards of thirty years old, the trees left on it have been most injudiciously and erroneously selected for any thing like profitable wood, being mostly beech and elm. I beg here to observe as I go along, that oak, and nothing else but oak, is the only profitable trees for coppice cuttings, and wherever such a plan is intended, nothing else should be reared. I am of opinion, however, that the trees in this part of the bank, as in some other parts, should be reared up as standing or ornamental timber trees, and for this purpose, nearly the same method as in these may be observed, with this difference, that it abounds with the natural growths of elm and oak from the old stools, and beech from the plants; as the value of all these kinds of trees, ~~any~~ ash, elm, and beech, wholly depend on their sizes, wherever they are the predominant trees they should be cultivated till their timber become valuable; this being the case here, it would by no means be advisable to cut it over as a coppice at present, even admitting the supposition that it was intended to convert it into that purpose in future. As the natural stools of elm, ash, and what of oaks there are, ~~have~~ been thinned, so that many of the shoots have died altogether, and many more become stunted; the whole of their stools should be immediately gone over, and thin away all the dead and dying shoots, and such as are evidently hurting each other, leaving not more than three of the very healthiest and most

thriving of the shoots on every stool, and when pressed on the sides by another tree, not more than two, in this way rear them up to be timber trees. Observe, that what of the oaks require to come out, must be barked in their season. If it should be thought advisable afterwards to convert this into a coppice, after these trees have been brought to be of some considerable value, the whole, except a proper number of reserve trees, should be cut down and the ground wholly filled with oak. I must here be permitted to observe, before proceeding farther, that it is my opinion, from the conspicuous situation this bank occupies on the estate, from east to west, no part of it should ever be coppiced, as the whole of it will carry timber trees for ornament to maturity,—the sublimely grand and venerable old trees about the house and in this bank; I would term perfections of nature's beauty. Continue always to rear oak for underwood amongst the large trees, to cut every twenty years, both as profit and shelter for game.

No. LVI.

Approach to the House.

The trees on both sides of this avenue are, for the greater part, very healthy and thriving, some beautiful spruce, and a few fine larch in the hollow should be cherished with care, also all along the top of the bank; on both sides the Scotch and spruce firs should be kept up, the greater part of the hard wood cut

over for underwood, keeping the selection of trees to be reared to maturity as timber trees at distances of fourteen feet, and in the bottom of the avenue at ten feet on each side, lengthways, but fourteen feet up the bank ; keeping always a tree in the centre, between the two outside ones, in a triangular manner ; these trees having two sides to branch out, will rear up closer than in the interior of the plantation. In the young clump below the fog house, a few of the best larches may stand as timber trees, as they will come to maturity in this situation ; the whole should be immediately thinned out to distances of eight feet, tree from tree, and in five or six years after, to sixteen feet, tree from tree, making an equal selection of all the different kinds already on the ground, to give variety to its look. The soil here being a deep loam, will carry any kind of trees. The trees on both sides of the road, up to the gate, are already particularly beautiful. It would even add to the grandeur of this ravine, if the tops of the trees were allowed to fall out and hang over the road, forming a kind of canopy ; this may be so far accomplished by allowing a tree to press the top from the inside, and when plants are to be put in, plant them in a sloping direction ; a prop may be put in the inside to bear on the top of the tree outwards ; were very tall trees to meet in the tops here, it would be sublimely grand in a sun-shine day, as the passenger walked under them, or in a moon-light evening.

No. LVII.

Young Plantations.

This is a very healthy thriving young clump of planting, and from the soil and situation, is remarkably adapted for planting, and will carry trees of any description to maturity; as there is a variety of kinds planted, nothing is required but to thin out such as are upon the ground, of every kind alternately, to twelve feet, tree from tree, except along the top of the bank; wherever there is a choice of trees, take away the larch, saving the hardwoods and firs in equal numbers in the interior of the bank, to give variety to its look, always rearing up hardwood for underwood amongst the large trees. In ten years after, a selection of fine trees may be made, to be thinned out to twenty-four feet, as large ornamental trees, and those to be taken out will then be of considerable value, keeping always the ground full of underwood, to be cut over every twenty years, for profit, as a coppice wood.

The bank of older trees to the west of this, may be thinned out in the mean time to the same distances, and in the very same manner dealt with on the bank. The haugh below the bank, on the west end, the standing trees, such as are to be reared up for ornament, may be singled out just now, to twenty-four feet; a few of the best ash, with which it abounds, may be spared in the mean time till their timber come to be of use, or as long as they are not injuring the standing trees, the other to be cut for underwood.

In the sliding bank betwixt the two places, put in

the hoop willow at not more than three feet, and allow them to stand till their roots run together to firm the bank, when other trees may be put in ; where it is always wet, poplars should be put in and reared up as timber trees. I have known poplars planted in situations and soils like this, or of a similar nature, measuring twenty-five solid feet each tree, and sell at L.3 per tree, in twenty years growth. Rear them at twelve feet, tree from tree ; one Scotch acre will carry about 400 such trees, making a sum of L.1200 for one acre in twenty years.

No. LVIII.

Young Strip.

This strip is unfortunately too narrow to serve, as it should do, the purpose of ornament and shelter ; it is also by far too thick, and if allowed to stand much longer, will be the means of killing many of the trees, as it keeps them so damp that mortification is apt to take place amongst the roots, and kill the whole ; it should be immediately thinned out, to at least eight feet, tree from tree ; when a choice can be made, spare every other kind of trees, and take away the larch first. As most of the hardwood is beech, which is not fit for underwood, where there is a likelihood of their coming to be timber trees, they may be reared up ; but where there is no such tree, plant in oaks as well for underwood as to be reared for timber trees. In thinning for the first time, take particular care to have always a tree opposite to each other across the strip, to prevent its falling into gaps, say thin in a

triangular form; when the trees get from twenty to twenty-four feet high, it should get its second thinning, say, to about sixteen feet, lengthways, always spare the most healthy, best, and long lived trees to be reared up, and keep the ground full of underwood. Larch fir is by no means a proper tree to be reared either for shelter or ornament in a narrow strip or on a very exposed situation.

No. LIX.

Home Plantations near the Mansion.

The trees here are in a most healthy and thriving state, and from the situation they occupy, both as to ornament, screen, and shelter, deserve particular attention, in rearing proper long lived trees. To effect this most desirable of all objects, I would advise making a selection of the oak, Spanish chesnut, plane, beech, elm, ash, Scotch spruce, and silver firs, if it was possible to divide them, (although I am aware from the state of the plantation, it is not,) to equal numbers on the ground, which would have a very fine effect on its look, both in summer and winter. Trees to be reared for this purpose should be most skilfully selected, say marked out, and all others that in the least interfere with them taken away, to give them room to branch out on all sides; this should be carefully attended to, year after year, as their branches spread out, and if possible, not to bare them more on one side than on the other, also to have their branches equally spread out on all sides here, and on both sides approaching round the house, all which should

be attended to in the same way ; it must not be understood that I limit any particular distance for these ornamental trees to be thinned out just now ; I would rather prefer keeping them close as otherwise, particularly on the exposed sides, taking special care not to allow another tree to stand so close as to whip the standing tree ; thin gradually out, although it should be the work of several years. In determining on those trees that are to be reared up, it is most proper to keep them in regular distances, and that I would in this place circumscribe to be not more than twenty-four feet, (when finished thinning,) every way, but where having open sides, either one or two ways, they may stand closer ; observe, that although I intend the trees that are to be reared up to perpetuity, so to speak, to stand at regular distances of twenty-four feet, yet they are not to be thinned out to this for a succession of years, only a due regard must be had to it in first determining on all such trees ; sometimes it may so happen that a less tree than its neighbour may be selected to stand, and the largest or most aspiring taken away ; provided it be equally healthy and thriving, as it many times happens, the smallest is the best, both as to situation, kind, and figure ; sometimes a tree of this kind may be more properly topped down than taken out ; as it should be always understood that the ground here must be kept full of underwood, which should be only reared to go no higher than the undermost branches of the large trees, and only to keep pace with them ; this is most easily effected where the underwood consists of growths from stools of oak, elm, &c., as the aspiring shoots can be now and then cut away, and the more dwarfy allowed to come up on the ground ; however, where

we are now treading so close to the mansion, the underwood should consist chiefly of evergreens, say laurels, small spruce firs, and such like. Observe the trees in this plantation were only about twenty years old, and stood at distances of six feet only, tree from tree, when the survey was made and the report given.

No. LX.

General Remarks on the Plantations, from No. LV.

I have all along, as I said at the beginning, considered the whole of the plantations, in so far as it is attainable from the present crops on the ground, to be reared up as standing plantations, as inseparably attached to the lands, in which respect they add (and while kept on it, will ever do so) to the value, at least four times more than their intrinsic value as timber; and it is of the very greatest importance carefully to propagate them as such.

I.—It is agreed at all hands, that to have large ornamental trees, they must have room to spread out, and wherever a thinning out for this purpose is suggested, no time should be lost in having it finished.

II.—One chief beauty of a tree is, its being well clothed with branches, and it is wonderful to observe what nature does for trees in this respect, if they have equal room, the equality of their branches is truly surprising in healthy trees, even granting that one side, which is generally the case, unless in large plantations, be exposed to the storm, particularly the

oak, the Spanish chesnut, the plane, the ash, and almost all the fir tribe ; but the branches of the beech and elm will often get sickly on the exposed side.

III.—Pruning is always detrimental to the health and figure of a tree, and the pruning-knife should never be put on a tree after it is six feet high ; therefore, when it arrives at this height its every part, both as to trunk and top, should receive all the shaping and pruning that is necessary, or that human art or ingenuity can suggest to make it a proper tree, whether indeed it be for ornament or profit as a timber tree, unless where a branch breaks by misfortune or dies, by all means take such off close by the bole or trunk of the tree.

IV.—In some of the plantations which I have been endeavouring to describe, there has been some injudicious pruning ; indeed nothing could be worse than to prune healthy branches off fine healthy trees, with a mistaken idea, to let up a dwarfish tree, and the more so, as there was no use for such a tree in the plantations we are amongst ; what is done cannot be recalled ; but no such system or practice should be upon any pretence whatever allowed in future.

V.—Observe, that in some of the plantations where the pruning has been going on, there are a number of these polish trees that will chance to stand, should these, as they often do, send out a young shoot or sucker from the pruned off branch at the bole, be sure to allow it to remain if it will, and not pair it off, as is sometimes done, and indeed often necessarily in other cases.

VI.—When layering is to be done, either with a view to rear underwood, or for standing trees ; if from oak,

Spanish, cheanut, elm, or plane, if the plant to be layered down is not above two inches diameter at four inches from the root, rather than take out the half of the root, slash with a knife the plant about six inches up from the ground or root, half-way through in the under side, say the side you bend it to, in order to make it bend down, keeping the bark whole on the upper side; also slashing with a knife the shoot you lay on the ground, to make it strike root. See this fully explained in my Forester's Guide.

VII.—In laying down spruce firs, there must be no breaking of their bark, and if it can be done without injury to the roots of the tree on the other side, cut the roots on the side to be taken up, at two feet from the tree, taking care not to loose the roots on the under side, and always bending in the young fibres, or roots that come up amongst the earth, carefully covering them over with earth.

VIII. and Lastly, I need hardly remark that when these plantations are thinned out to the distances mentioned, that they will appear thin to the look for two or three years at first, the more so, as they for the most part have been too long in being thinned; hence, many of the trees are very polish, but the necessity of doing it for the salvation and future prosperity of these plantations, must be obvious to every one the least conversant with plantations to be reared for such important purposes, and which is of infinite consequence to the proprietor. Had the greater part of these plantations been made only about twelve yards wider at first, and carefully attended to in rearing, in other twenty years the timber would be worth more than the lands they enclose;

and the same may be said of the plantations of other

suffice it to say, that the thinnings should be attended to with the greatest skill and activity.

No. LXI.

Old Fir Wood.

The most of this old fir plantation requires thinning, and if judiciously done, will still improve it; notwithstanding its having been most miserably treated in thinning, &c. formerly. The method I would propose for recovering this plantation, is to go carefully through the whole, and mark such of the firs as are injuring each other; also, all such as the other tree or trees will be benefited by their being taken away, and all the firs that are over-topping and injuring any hardwood tree, thereby allowing the hardwood to get up, if it is a promising plant; if it is not, and if oak or any such as will grow by cutting, let it be immediately cut over; but in this case, some of the firs may even be spared till the young growth comes up, and so soon as they begin to injure them, cut away the firs. The same method may be observed in the corner west from the cross dike, till where it narrows into a narrow strip, with this difference, that all the healthy thriving Scotch firs should here be saved till the projected young plants, in the field on the south side, come up; here I have been rather more sparing of the field than the old line by the plough furrow, as the old strip is of sufficient breadth already; I have marked the letter P. thus, on a standing tree in the strip, &c. and making the young plantations of nearly an equal breadth, from the boundary

dike on the north, all along westwards to Lord ———'s approach gate; here the whole trees should be spared, only taking away such as die, till the young plantation comes up. It may be here necessary to mention the method of sale for such thinnings, &c., and a reference to this will suffice for other plantations of the same description on the estate.

The only plan to sell wood of this kind, and that too attended with the least risk as to payments, is a country sale, 'in a country so populous as this, and the best and most profitable method for the proprietor of effecting a sale is, to mark and number off the trees to be sold, with a wood-iron, putting them into lots of from three to ten trees, according to their sizes and value, taking special care to have every tree marked according to its proper designation, such as Lot 1, 2, 3, and so on; fix on a day of sale, advertise it through the country by hand-bills, &c. sending them to all the coal-works, &c. round, and sell each lot by public auction, to the highest bidder. Each lot, before the sale, is commonly valued, which is absolutely necessary when the lots are large, as well for the satisfaction of the proprietor, as for fixing the upset price; but in the case of the woods before us, I do not think, for my own part, that it is necessary, because having a person who is a judge to conduct the sale, he will at once know whether or not it brings its value, unless the proprietor wishes to be satisfied before hand of the probable value. As there may be more to dispose of than supply the country demand in one season, whenever this is seen to be the case, the sale should be adjourned, for three months at least; a good deal of skill and caution is required in putting the trees into proper lots, to make

them take a ready sale, and bring the most possible money for them; and the only plan for this purpose is, to put all the most valuable trees in lots by themselves, and these generally in very small lots; by no means mix the good or valuable trees with the trash, as useful wood will always have a competition of offerers, and bring its value, and oftentimes fully more; whereas inferior timber oftentimes does not. All different descriptions of timber should be loted and sold separately. The whole should be loted and sold off standing; I have always found timber of this kind sell best growing; besides, being mostly Scotch firs, were they to be cut down they would soon spoil, and the whole behoved to be sold off at once, whether they brought their value or not; whereas when standing, they can be sold or not, as there is or is not a demand. The whole must be sold under proper articles and conditions of sale, binding the purchaser as to cutting, removing, paying, &c.; a copy of the customary articles, in sales of this kind, will be given at the end of this book.

Another plan, and I am of opinion the most advantageous for this plantation, as also for the improvement and value of the estate; as the greater part of the firs are at their best, and indeed have arrived at that stage of size and growth, at which Scotch fir trees, for the purposes they are applied to as timber, is more valuable than if they were of rather a larger size, and although they were to stand for twenty years longer, they would not be worth one sixpence more per tree, supposing the price of fir timber to be the same, although I am also doubtful if many of them would ever live other twenty years. The plan would be to mark off, and reserve the whole

trees, except such as are dying along the east and north outsides, to the breadth of twenty yards or thereby, and cut the whole of the rest over, and convert into an oak natural coppice wood, that is, fill up the ground with oak where there is none, to be cut every twenty-four years; in this way, it will pay an annual rent of L.7, 10s. per acre for time coming, without any expense of plants or planting, and the belts on the outsides will always keep up its look as a plantation for shelter, &c.

No. LXII.

Strip along the Road Side.

From about a chain length south of the approach road, north to the old wood, this strip consists chiefly of old Scotch firs, which in many places want thinning; but from the height of the trees, and their neglected state, there would be the greatest danger in doing so, that is to say, thinning, as it would be a mean of breaking down many of them with the cuttings and make great gaps in it, which, in some instances, is already the case; the most effectual method would be to cut the whole down, widen and plant it up anew; but this would make a great blank for a long time. I am therefore of opinion it should stand as long as it will stand, taking always away the dead trees, and continue to fill up the present and all other blanks as they become naked, with spruce firs, oak, Spanish chesnut, ash, and plane trees; plant at eight feet, plant from plant, thin out at six feet high to sixteen feet, at twenty feet high, to thirty-two

feet, for large ornamental timber trees ; keep always the ground full of oak coppice for underwood, to be cut over every twenty years. Thin out the young part of it, at the south end, to eight feet, clearing away the firs from the hardwood plants. Nothing looks worse than strips and belts of planting along a public road, when they are permitted to fall into decay, which is the case with two many of our strips and belts of planting about half a century old.

No. LXIII.

Young Plantation.

In this plantation, as well as in all the other young new made plantations, there are far too many larch firs ; it would be much better to take a great many out just now, and put in other trees, to be reared up to maturity, as ornamental standing timber trees, and thus get a finished plantation at once, rather than wait on it. A number of the larch firs will transplant yet. As this plantation, adding to the old belts, will form the whole, when once up into a clump or cluster of plantation, or rather a strip or belt, which from its proximity to the house of ———, and no other that may be called a plantation on this side, it should be reared up full with various kinds of trees, particularly such as will become ornamental long lived trees ; when the larch firs are taken out, as aforesaid, Spanish chesnut should be put in ; here I may observe, by the way, that my reasons for recommending Spanish chesnut so much, is, first, because it is the most ornamental of all the hardwood

species, the oak not excepted ; second, it grows equally as fast, and faster than many of the hard-wood trees ; third, it grows to a larger size than many, and lives to as great an age as any of them, and its timber is as useful and valuable as the oak, and its bark nearly so, and upon the whole, it is a tree, although not generally known in this country, but on the soil we are now treading, it will grow equal, if not superior to any other, and will also grow natural by cutting, as the oak ; keep the ground always full, and thin out for the first time, when the trees arrive at a height of from six to eight feet, to twelve feet, tree from tree, at which they may stand this situation as a finished plantation, keeping a variety of all kinds of trees on the ground, to be reared up, and in connexion with that part of the old strip on the north ; always thin the trees to stand in a triangular form across the strip. This young plantation was almost wholly of larch only about five years planted, which should never be planted in small clumps or strips in an exposed situation.

NO. LXIV.

OLD PLANTATION.

This Plantation is in Argyleshire, and exposed to the Western Ocean.

From the situation this cluster (or clump, as all such are generally termed,) of planting occupies, on this farm, it is of the greatest consequence to rear it up as a standing ornamental clump of timber trees to

maturity ; in the report it shall be scrupulously attended to, to effect which attend to the following system : On this soil and situation, larch fir is by no means a tree for ornament, nor will it ever come to maturity here as a timber tree ; this may be seen by the dwarfish and unthrifty state of the larch fir trees already on the exposed part of this plantation, while every other description of the fir tribe is healthy, vigorous, and thriving. In thinning, wherever there is a choice, the larch firs should be taken out, and every other tree left in preference to it ; this should be particularly attended to where there are Scotch spruce, and silver firs, as these kinds will thrive and live to a greater age than the larch ; besides, they are much more ornamental, and afford much more shelter in winter ; oak, plane, and ash are the only kinds of hardwood that should be reared ; for this purpose a careful selection of the best and most promising shoots of oak should be made of the natural growths from the stools marked off as standards, and reared up as timber trees, and the healthiest and most thriving of the plane and ash, with a few of the best of the beech, should also be marked off as reserve trees ; a very careful selection of the above kinds should be made, and marked off to stand, the rest cut away, and those should be selected at equal distances, or as near as can be got, at sixteen feet, tree from tree, keeping the outside row next the public road a little closer, say about twelve feet, they having room to branch out on every side, will do closer. In the low part of this clump, where there is nothing but larch fir, and where, indeed, both the soil and situation are better adapted for larch than the high parts of it ; here the larch is past its best, and dying, and

requires to be taken away, and longer lived trees put in their places ; and I would advise, as by far the best plan, before bringing this plantation to a finished state of improvement, to cut out all the larch first immediately ; many of these trees have been spoiled by allowing the surface drains to fill up, and the water to stagnate above their roots, which has killed some, and has been the principal cause of many more being blown down ; indeed, neglecting the state of the drains, thereby allowing the water to overflow the roots of the trees, is sufficient to kill any tree. These drains, which appears to me to have been most properly and effectually done at one time, should be immediately reopened, cleaned out, and the water properly let off. I have marked, as I went along, a number of trees which should be taken out in that high part of this clump, which should be cut immediately with the larch firs, and in summer, the oak shoots that are to be reared up as standing timber trees, should be marked off, and the rest of the shoots taken away and piled for the sake of the bark ; this being done, the thinning properly finished, as afore-said, and the surface ground drained, the whole of the blanks at present, with the ground, where the larch firs are cut from, should be planted up next season, and which should be done with plants of oak, Scotch elm, plane, Scotch spruce, and silver firs alternately, at eight feet, plant from plant, and when they have arrived at a height of from eight to ten feet, thinned to sixteen feet, tree from tree, bringing the whole into the same distances, at which, in this bare exposed situation, they may stand as a finished plantation. As it is properly enclosed, and should always be kept so, the ground should be kept full of oak for

underwood, which may be regularly cut for coppice ; at same time it will be found extremely useful in rearing up a tree or trees to supply the place of any of the old ones that may be broken by storm or otherwise destroyed. The oak, natural wood, or coppice on this farm is, for the most part, very thriving ; where the stools have been partially thinned they will require no more till it comes again of age for cutting. There are in many places a great deal of birch, alder, and even larch firs almost put into the very heart of oak stools, which was a most injudicious and ruinous method of planting, as they tend to extirpate the oak stool, which is by far the most profitable crop ; a very great improvement may be made in the oak stools before cutting time, both as to wood and bark, by going carefully through, and cutting all such birch, alder, and larch firs, or any other tree that is over-topping or in the least injuring the oak stools ; this should be done immediately, particularly before the sap rises in the oak, even the fine oak stools surrounding the small fields of Auchedroich, notwithstanding their easy access, are much annoyed with trash of this kind, a few open casts cut through some of the marshy places here to let off the surface water, would much improve the oak stools before cutting time, from the descent of the ground this could be very easily done ; observe, I do not mean deep draining, but only small open casts or ruts on the surface, merely to make the surface water run off, keep one course, and not lodge amongst and overrun all the oak stools ; observe the same through all the coppices on this farm where wet. This plantation contains upwards of 50 acres, a third part of which was a complete bog ; it would not carry a person before being planted, and was only surface drained

when planted, while the trees have made great progress, and where the water does not run off the high grounds over it. The trees have drained it so that cattle graze on it in many places, and affords a stubborn proof that trees will drain such marshes.

No. LXV.

Culnashennaig Farm, Argyleshire.

The whole of the wood, both planted and natural, on this farm, is very healthy and thriving, and had the oak coppice stools been thinned in time, it would have been equally productive with any wood of the kind in Scotland at its age, both as to wood and bark. I may here observe by the way, that all oak coppice stools should be thinned out the year after being cut for the first time, as by allowing the whole of the shoots to remain till the age of ten, twelve, or fourteen years, the whole becomes stunted and unproductive, and in some cases many of the stools die away altogether, and many more never get out of the reach of cattle when they are let into the wood ; whereas, when thinned in time, the principal shoots get out of the reach of cattle before the time of letting them in ; early thinning should be most particularly attended to. See this fully explained in my Forester's Guide. The whole of the woodland on this farm is excellent, both as to soil and situation for a natural oak wood, and nothing will ever pay the proprietor better ; but the delightful prospect of this farm, and from its commanding eminence, renders it an object more worthy of ornament than profit, and nothing in nature could more effectually accomplish this purpose, than

by clothing its face with clusters of standing ornamental timber trees, which, if properly and tastefully laid out, would not only add immense beauty and value to the farm, but to the whole surrounding country for many miles.

The plan to be pursued with the present crop on the ground is, that the trees about and above the bridge at the mill, should be singled out to standing timber trees, up the river side, on both sides, to where the coppice ascends the hill, carefully selecting the best of the trees at sixteen feet lengthways, to stand, and as the strip is but narrow on this side the river, they may stand at from eight to twelve feet the deep way, always taking special care to have the trees standing in the gap in a triangular manner, so as not to whip each other in the top; where there are stools of oak or ash, two, or not exceeding three shoots, may be left, in the mean time, particularly, where they hang over the water; passing up the water side towards Garbertmore; there is for a long way nothing but larch firs, and which, for the most part, are very thriving at present, but so remarkably thick on the ground, that it is altogether impossible they can stand much longer in their present state, the ground is so loose about the roots that a person could push them out by the root with the hand; when plantations are allowed to remain long in this state, mortification often takes place amongst the roots, which spoils the whole plantation; there has been some hardwood plants put in here, but these are completely extirpated. In this low lying sheltered place where we are now treading, I have no doubt but larch firs would come to maturity as timber trees, for which purpose, a few may be reared;

although they never will come to be so profitable as oaks ; this part of the plantation should be immediately thinned out to not more than from eight to ten feet, tree from tree, that is, not less than eight nor more than ten, and when this is done, a plant of oak should be put in betwixt each of the larch firs ; in about six or eight years after, another thinning should be given, when it must be directed chiefly by the healthy and unhealthiness of the trees, leaving, as aforesaid, a few of the healthy larch to be reared up to maturity in the sheltered places, taking out at this time every third larch betwixt each two, and put in an oak. The most of the natural oak stools on this farm requires a thinning, and if judiciously done, they will be much benefited by it before cutting time, both as to the quantity of wood and bark ; they should also be relieved of trash of birch, alder, hazel, and larch firs, the same as directed in the other two farms. There are also a number of ash stools on this farm, as well as on some parts of the others, all which should get a considerable thinning, leaving only three, or not exceeding four shoots on one stool, so as their wood may come to be of some value as timber by cutting time, and which will greatly improve the growth of it, if properly managed, relieving them of all trash. The thinning of the trees at and above the bridge ;—on this farm the cutting of the large firs and other trees in the old clump or Barnellian farm, and clearing the oak and ash stools of all rubbish and trash, as aforesaid ; all this should be done before spring, that is to say, before the sap begins to rise, say before the first of April, when the thinning and barking of the larch firs should begin.

No. LXVI.

*Barnegaul and Gloster Farms, Kintarbert Estate,
Argyleshire.*

In different places of these farms are excellent land for planting, which would be very productive and profitable in wood, and is good for nothing else ; but not being instructed to take notice of any new land, for the present I will pass it over. On these farms there are many unenclosed natural stools of oak, which prove to a demonstration that these farms have been at one time much better covered with wood than they are now ; notwithstanding their unprotected state, there are a great many oak stools, from which timber trees could be reared as single standing trees, and that too without taking a single foot of ground from the farm. To have such trees in these places, is an acquisition of the very greatest importance, not only on the above farms, but on all the others ; but particularly here, on the easter part of Culnashennaig, taking all these places together. From the unenclosed stools which are totally without and unconnected with any of the coppice enclosures or boundaries, two to three thousand trees could be reared, say from some of the stools two, and not exceeding three trees from any of them, which will take little trouble in rearing, besides beautifying in a superb degree those naked places, they will in twenty years be worth at least L.2000 sterling ; in forty years, upwards of L.6000 sterling, and that without taking one foot of land off the farms. I beg to call the proprietor's particular and immediate attention to this ; all that is requisite is, to go

through such stools, and carefully select the proper shoots to be reared up for trees, and cut away all the rubbish from off the stool, so as they may get all the nourishment possible, and a very great many of these that are already far advanced will get out of the reach of cattle the first year's growth: But such of them as have bad tops and require to be cut over, must be enclosed single for three or four years, till they be out of the reach of cattle; this is simple, easily and effectually done, by four or six stobs, and these warped close with the small prunings of larch firs, which will prevent them, for six or eight years, from either cattle or sheep; as there is plenty of this kind of rubbish on the farm, two men will do one hundred of such stools in a day, or nearly so, so that the expense is not worth mentioning, and at all stages, and every year of their growth, they are adding five times more than their intrinsic value as timber, to the estate or farms. For the proper method of rearing all such, consult my Forester's Guide on converting natural stools into standing timber trees.

No. LXVII.

———— *North and West Belt.*

This belt, commencing at the West Lodge, running westwards along the public road side, has been thinned; but I am sorry to say, by no means with that care and attention that a belt of trees occupying such a conspicuous place for ornament and shelter as this does on the estate, ought to have been. Before beginning to thin a plantation of any kind, but

particularly at such an advanced age as this, (as formerly noticed,) a consultation, as it were, should be held within the Forester's own breast before putting a mark or an axe to any tree in any plantation, deliberately asking himself for what future purpose or design is this plantation intended, is it to rear trees to maturity, to be cut down in order to bring money to the estate, or is it to rear trees to stand for generations on the ground, chiefly for ornament? And here in all cases, but in the latter case particularly, the proprietor should be consulted. Here it must be obvious to the most ignorant in the profession of forestry, that a different treatment is requisite. In so far as the thinning of this belt of planting has been proceeded in, I am at a loss to discover what has been the design; sometimes and in different places, the most ornamental, long lived, and healthy trees have been taken, and a few polish trees left that never will be either ornamental or profitable; in many other places the reverse has been the case, and upon the whole, the belt has been very carelessly dealt with; so careless in some instances has the cutting been proceeded with, that the very tree cut has been allowed to destroy the one it was intended to relieve, and apparently without any attempt being made to save it. As this belt is certainly very ornamental on this part of the estate, and should be reared as such, and trees arrived at such an age when cut down cannot be reared up in a lifetime, no one will deny that deliberation in marking, and care to preserve the standing trees in cutting is truly necessary. This belt will require to be correctly gone over again, and take away the polish trees of ash and oak, such as never will come to be trees, and dress up their

stools for growing, so as trees may be reared up from them ; fill up all blanks with Spanish chesnut and spruce firs, to give a variety to the look of the belt as well as embellishment and shelter.

No. LXVIII.

Farm on Dumfries Estate, Ayrshire.

The two young stripes of planting on this farm, planted in 1815, is at present full and very thriving. I am still at a loss to discover the design of planting the larch and Scotch firs in small groups across the stripe ; had the designer but cast a single glance to some of the stripes on this estate planted thirty years ago, where the same plan is adopted, it would have spoken more than volumes the impropriety of such a plan. In almost the whole of such stripes, the larch are falling into decay, and the stripes and belts showing numerous melancholy instances of gaps and blanks through them. As I had occasion often to observe before, this is not at all a soil nor situation for larch firs ; as soon as it can be overtaken, say next season if possible, the firs should be thinned out ten feet, plant from plant, and oak, Spanish chesnut and plane put in betwixt them ; after these plants are six feet high, the whole larch firs may be cut, but some of the Scotch firs may be reared up. The old clump of firs on this farm is dreadfully exposed, in which case, nothing can be thinned out of it, but allowed to thin itself ; take away the trees as they die, fill up blanks with the aforesaid hardwoods.

No. LXIX.

Young Planting, Dumfries Estate, Ayrshire.

This young planting on the south side of the road is filled up with too many larch firs. These are arrived at a fine height and age for thinning out, and planting hardwoods amongst them ; thin them out to six feet, and plant in oak, Spanish chesnut, elm, and plane betwixt each alternately. Sheep have also been in this planting. I cannot pass over this planting without noticing a most ignorant method used through the whole of the young plantations, of planting and protecting the young hedges, which is the great mean of their never coming to be proper fences ; the plan most frequently adopted, at least on the one side is, as in the case here, the paling is drove up the inside of the hedge, and the hedge is either left out next to the field to be pastured, or on the road side unprotected, and of course, the hedge is exposed to cattle and sheep, either treading it down with their feet or eating the grass from its roots, either of which, particularly the breath and wool of sheep is equally ruinous to young hedges. This mode of procedure is like a man buttoning his great coat behind his back to protect his belly from the storm. With equal ease and the same expense, the paling can be put up betwixt the hedge and the pasture field or public road, and then it protects alike the young hedge and the planting. This is one reason why so many of the hedges are such pitiful fences on this estate, and so full of gaps.

No. LXX.

Fir Plantation, Ross-shire.

This plantation, consisting wholly of Scotch firs, is for the most part in a very thriving state, considering the little attention that has been all along paid to it; this can only be accounted for from the excellency of the soil for rearing wood. I may here observe, that the whole within the boundaries of this plantation, is capable of rearing to maturity almost every kind of timber trees. Had it been planted with oak in place of Scotch firs, it would by this time have been paying the estate at the rate of L.7, 10s. per acre of annual rent. And I am perfectly aware, that to convert it still into an oak wood,—say to cut every twenty-four years as a coppice, it will pay better. This could easily be done, by disposing of and cutting down the firs, which could be disposed of as prop-wood, &c. If such a plan was to be adopted, I would recommend that a belt of the firs round the outside be left,—say not less than one hundred feet wide. This would still keep up the look of it as a plantation, and cover the naked look of that part of the estate, as well as afford shelter to the interior of the coppice, as every inch of the ground, besides some more waste land that could with propriety and advantage be added, will carry natural oak wood as coppice, if I may be allowed the term, to perfection. Nothing will ever pay the estate better, and that too, producing a regular annual rental for all time coming, without any expense but the first planting with oak, the expense of which, the present crop would do much more than

pay, it being already well enclosed. But let us take the present crop on the ground, and here the ground, as aforesaid, will carry the first to full maturity as timber trees, still these will only improve and increase in value for forty years, not exceeding that time, when they will then fall off in value, and of course, require to be all cut over; nor will they increase in value to that degree to pay any thing like a fair rental for the ground they occupy. The rearing up of these trees too will be attended with some difficulty, from the long neglected state of thinning; still thinning is actually necessary, as there is evidently a great many more trees on the ground than it can afford nourishment for, so that in a very few years the whole will become stunted in the growth for want of nourishment, as is evidently the case already in some particular places. It is therefore necessary, to preserve any thing like a crop of thriving trees on the ground, that the whole be thinned out immediately, and that this must be done with the greatest care and attention, as in many places where the ground is so over-burdened, it has become so loose, that the trees will be easily blown over, so that the cure will become worse than the disease; but to prevent this, the thinning must be proceeded with gradually,—say the first thinning, take away all the worst and most unthrifty of the trees, thinning out to about eight feet, or as near as can be, tree from tree. Allow it to stand with this thinning for five years longer, when the trees will have firmed in the roots, and will admit of another thinning, when they may be thinned out to sixteen feet, tree from tree, or as near as can be, when the thinning will be of considerable value. Take care to leave always the most healthy and thriving of the

trees, at which distance they may stand till they arrive at maturity; take away always such trees as die before the timber of them be useless. If this plantation is allowed to stand in its present state much longer,—say for a few years; it will extirpate itself, as it is plain to a demonstration, that the trees are killing each other, and the whole will soon be stinted in their growth. The thinning should be set about as soon as possible, and proceeded in with the greatest caution, skill, and diligence. It is proper to observe, that the trees to be taken out should be most carefully marked off by the hands of the forester, and taken down under his superintendence. If the proprietor thinks it advisable to rear the present crop after the thinning is finished, a considerable rental should be got for the grass of the plantation for cattle wintering, which will do no harm to the trees; but no sheep should ever be admitted at any time.

This part of the plantation, which is wholly of Scotch firs, occupies very fine land for rearing wood of every description, and from the situation it occupies it is not so useful either for shelter or ornament to the estate as many of the other fir plantations. I am therefore fully of opinion it should be turned into that which would be most advantageous and profitable for the estate. I am also well aware that the present crop on the ground will not be of more value to the estate although allowed to stand for eight or ten years longer. I must here observe, by the way, that there is a certain size that Scotch fir will arrive at, when their intrinsic value as timber is as much as when the trees have got eight or ten, or more years growth, and when they may have arrived at a larger size. To explain this, I mean when the trees arrive

at a size proper for prop-wood, when they are rather too large for this purpose, and not large enough for cutting into deals, then they are only of the same value as prop-wood, and indeed scarcely as much, as they are only at this state of their growth fit for that purpose and nothing else, they are more clumsy and cost more in carriage and freight, which rather diminishes their value. To dispose of the wood on this plantation just now, it will bring more money, and meet with a more ready market, than if allowed to stand for ten years longer. The most advantageous method with this plantation, both for the present and future good profit and advantage of the proprietor and the estate, is to sell the present crop and plant it up with oak, converting it into a natural oak coppice wood, for which purpose it is admirably adapted both as to soil and situation, as every inch of the ground will carry oak coppice; it will pay at the rate of L.7, 10s. per acre for all time coming, and as it is nearly all well enclosed, there is only the expense of planting required. The best and most advantageous method of disposing of the present crop would be to divide it into lots or haggs of yearly cuttings, say into five or six lots or haggs; advertise and sell it by roup, binding the purchaser to cut and clear a lot annually, beginning at the west end, and annually cutting a lot; and when cut, plant up with oak, marking off these lots in straight lines across the narrow way, and then planting up the cut lot, which should be attended to yearly after the cuttings. There can be a temporary fence run across betwixt the cut and uncut planting, to protect the young planting till the next lot is cut, and so on throughout the whole. Observe, that in planting up the haggs,

the whole must be planted with oak at eight feet distant, plant from plant ; in some of the exposed, or very bare places, a larch fir may with propriety be put in as a nurse tree betwixt every oak, only till the oak gets about six feet high, when the larch should be cut out. Before making the sale, it will be proper to have the lots marked off, and a value put on each lot, either for the upset price or for making an offer for the proprietor, in case of combination among the offerers, and if there is a demand, and likely to bring its value, the more lots sold in one year so much the better ; should the proprietor think proper to adopt this plan, there should not be a day lost in advertising and selling the wood preparatory to planting. Should the proprietor think it proper to rear it up as a fir plantation, it should be immediately thinned out from eight to ten feet, tree from tree, and in five years after, to about sixteen feet, tree from tree, and the remaining fir trees allowed to stand to maturity ; but this plan will never pay the estate one pound in seven that the natural oak will do ; I would therefore call the proprietor's immediate and particular attention to converting it into an oak coppice, &c.

EXPERIMENT FARM, *June 2, 1827.*

DEAR SIR,—I have made an attempt to ascertain whether the common Scotch oak or the Turkey oak bore the greater weight of bark ; which I have compared with as much exactness as I could, and I hope the result will be satisfactory.

I selected trees of each sort, which to appearance had the same chance of growing,—their health, exposure, and the soil they grew in being the same; of the same age, (16 years,) and each pair admeasuring the same over the bark. The common oak bark lost seven-eighteenths of its weight when green, in drying; the Turkey oak bark lost eight-eighteenths, and weighed, when dry, from one-sixteenth to three-sixteenths, or at an average, about one-eight more than the common oak bark.

Wishing to know the relative value of each kind of bark, I took 480 grains of the dry bark, and proceeded to ascertain the quantity of tannin, or the tanning principle contained in each kind, by Sir Humphrey Davy's method.—See his *Elements of Agricultural Chemistry*, second edition, page 91.

I found the above quantity of common oak bark to contain 36 grains of tannin. And the same quantity of Turkey oak bark to contain 28 and four-fifth grains of tannin. So that when the common oak bark is worth L.9 per ton to the tanner, the Turkey oak bark is only worth about L.7 per ton.

From the above experiment it appears that the bark from an acre of common oak is nearly one-tenth more valuable than from an acre of Turkey oak. Notwithstanding this difference of value, however, I am of opinion, that in particular situations, such as well sheltered places, where the soil is of a light sandy nature, it might be more profitable to plant such places with Turkey oak instead of common oak. As from the rapidity with which the Turkey oak shoots forth, in such situations, above the common oak, I would suppose that it might probably turn out double the weight of bark.



PART OF THE GREAT SPANISH CHESTNUT TREE AT RICCARTON.

I will feel much obliged by your remarks on the above at your convenience, and remain,—

Dear Sir,

Your most obedient Servant,

JAMES GOW, JUN.

To Mr. Monteath.

As the Turkey oak has been but lately planted to any extent in this country, I have not been able to make any experiment on the utility of either its bark or timber; but shall not fail to do so as soon as opportunity offers. In the mean time I consider the above letter as too valuable to be withheld from the public. It appears that the Turkey oak, in point of strength, has the same tannin principles as the Spanish chesnut; but I am also aware that the Spanish chesnut possesses many valuable advantages over the Turkey oak, both as an ornamental and timber tree; and it can also be propagated by layering, as the common oak, although I have pursued a system of layering from the Spanish chesnut for these number of years with success, and can give many proofs of it; yet many of the nursery gentlemen, whose judgment and experience, one would be led to think, should incline them to draw a very different conclusion, will not admit of it. A very stubborn and incontrovertible proof of it came to my knowledge a few days ago, and which I saw, and may be seen by every one: There is on the estate of Riccarton, the property of J. Gibson Craig, Esq. about six miles west from Edinburgh, a very large old Spanish chesnut tree, which had two bodies or trunks a little above the ground, and it is plain had sprung from one root; but one of the sides is now fallen totally into decay;

at one time it must have girthed upwards of twenty feet above the ground ; the healthy part of this tree is still sending out most luxurious branches, extending upwards of 200 feet round ; many of these branches bending downwards to the ground have of themselves taken root, and are sending up most beautiful young trees, one of them, as will be seen by the engraving, is a large tree. The aged parent, as if loath to leave the princely mansion on the one side, and a flower garden on the other, is rearing up a numerous progeny, and enfeoffing them in the beautiful situation they at present occupy, to propagate their name to generations yet unborn. I would advise all who attempt to deny the layering system, to go and see this tree ; it is also worthy a visit from all the curious lovers of trees, and must at once remind travellers of the Indian Banjan tree, to which it bears a striking resemblance. See an engraving of this prolific tree in frontispiece.

Like the fam'd Banjan tree whose pliant shoot,
To earthward bending, of itself takes root ;
Till like their mother plant, ten thousand stand
In verdant arches on the fertile land ;
Beneath her shade the tawney Indians rove,
Or hunt at large through the wide echoing grove.

The care taken to cultivate this tree by the proprietor and his young family, will very soon enable it to stretch its progeny with their beautiful sheltering foliage round one whole side of the mansion.

Old Trees West Side the Garden at Prestongrange.

In this grove of old trees, stands a Spanish chestnut, amongst the largest of the kind in Scotland as

to its solid contents of timber, and very much akin to the fine tree at Riccarton. This is truly a wonderful and magnificent tree, having a trunk upwards of sixty feet in height, and its uniformity of trunk from the ground to the top is exceeded by none in the kingdom.

One curious fact of this beautiful tree, (like the one mentioned at Riccarton,) it has of itself sent down two large branches across the wall into the garden, and by their sweeping the ground, the aged sire has been suing for the right of privilege to enfeoff his offspring in the domain of their aged sire. This has hitherto been denied, or they would long ere this have taken root. I am well aware, now when the thing is known, that the noble proprietor will give them a place either within or without the garden wall, to propagate the name to generations yet unborn. The two descending branches could be, with the greatest ease, layered out in the garden where they now are; and for my own part, I consider a tree of this kind well worthy a place in any nobleman's garden. Still should this be thought an incumbrance, these branches may be twisted out without the wall, and then layered down. If this is to be done, great care must be taken not to twist them out when there is any sap in the bark, for fear of twisting the bark off the branch at any part so as to hurt its growth.

There are a great many very fine trees of this kind at Loudoun estate, the seat of the Most Noble the Marquis of Hastings; some of them are large magnificent trees, rearing their mighty heads to the clouds like gigantic and imperishable pyramids, and

who knows but at this seat of ancient warriors some of them marks the birth-day of some great chieftain.

That larger tree, that of a nut was set
On his great birth, when all the muses met.

The dates of planting particular trees or even plantations, should always be registered and kept on an estate ; by this means the ages of large old trees can be accurately ascertained. In this case too, the plan of having the woods and plantations surveyed and valued, as in introduction, is of great use.

There is on the estate of Braco, in Perthshire, the property of James Masterton, Esquire, a wonderful and prolific spruce fir, the only one of the kind I have met with in all the course of my profession. The young mother or parent tree (such a name well becomes it) is not yet 16 years of age, and has ten of a progeny ; she brought forth her first born when eight years old, which is about half the mother's height, and every year since she has begotten one, and the last two years brought forth twins each year ; and by the indication of her branches to catch the soil on all sides as they expand, she seems determined to be more and more prolific, and with her progeny, nursed and clad at her own expense, in their beautiful evergreen mantles, bid fair to plenish the estate of Braco,

“ Like the famed Indian Banyan tree,
In Malabar or Deccan spreads her arms,
Branching so broad and long, that in the ground
The bending twigs take root, and daughters grow
About the mother tree, a pillar'd shade,
High over arched, and echoing walls between—
There oft the Indian herdsman, shunning heat,
Shelters in cool, and tends his pasturing herds
At loop-holes cut through thickest shade.”—*Milton*.

A famous tree of this kind in India, called Cub-beer Burr, is much famed throughout Hindostan for its great extent and surprising beauty. The Indian armies generally encamp around it, and at stated seasons solemn *jatamas*, or Hindoo festivals, are held there, to which thousands of votaries repair from various parts of the Mogul empire. It is said that seven thousand men find ample room to repose under its shade. But to return to our Braco spruce fir, which in its growth is certainly one of the greatest curiosities in nature. It is planting and rearing up of itself, without the aid of human art or ingenuity, a numerous offspring, and enfeoffing them in its native soil, to perpetuate its name to all time coming. This tree is well worth the proprietor's special care, with whom, I am glad to see, it is a great favourite, as also of Major Elliot, his son-in-law, who is a keen and skilful botanist. It is well known to those by whom I have had the honour to be employed, that for a number of years past I have recommended the layering down of spruce firs horizontally on their sides, particularly along the sides of private family walks, which makes a most beautiful screen, and shelter alike from the summer's sun and winter's storm, and withal a most excellent ornamental and impenetrable fence against cattle at all seasons. Although this was by many (like my layering of the oak) laughed at as nonsensical and chimerical at first, there are now stubborn proofs of the facts on several estates. Let all who doubt it go to Riccarton and Braco, and they will there see proofs of it without the possibility of a doubt. Nature herself, as if she deemed her generating powers overlooked by the slovenly woodman, seems to say,—I here give a free and manifest display of what I can do to the sceptical, and convince them that Monteath, the Forester,

is right in his ideas of layering down the spruce fir as well as the royal oak. Before laying down my pen I beg to observe, that before the plantations on the estate of Braco were planted, say about sixty years ago, there was not a tree to be seen in all that part of the country, after passing Dunblane. It was then the most bleak and barren part of all Scotland ; as will appear from the following anecdote. A gentleman who was born and brought up in America, came on a visit to General Graham at Braco, when the plantations were in their infancy, after passing Dunblane, he exclaimed in ecstasy—"What a glorious country this is! there is not a tree to be seen in the whole of it,"—the American concluding that no country was of use till it was cleared of wood. I need not say (as every traveller must have seen it) that the woods on the estate of Braco are a very great ornament and beauty to this yet naked and cold looking part of the country ; and they do infinite honour to the memory of the late General Graham, uncle to the present proprietor, who laid them off and planted them. At the time, he was laughed at as making a fruitless attempt to improve, by planting, such a cold poor soil ; but his enterprising spirit, coupled with his knowledge and abilities, overcame every difficulty, and have succeeded in making a little paradise where before there was nothing but black heath. His name deserves to be revered while a tree lives on the estate. I would say to the neighbouring proprietors of this yet naked country,—Go you and do likewise. There are many trees of spruce fir on this same estate layering their branches, and of themselves sending up fine young trees, some of these natural children are 20 feet high.

January 17, 1829.

Dunhail Moss. On the Estate of Rowallan, Ayrshire, the property of the Most Noble the Marchioness of Hastings, Countess of Loudoun, Baroness Mauchline, &c. &c.

This moss is said to contain 16 acres, and every inch of it may be converted into planting land; all that is requisite is, to cut deep open ditches where the water cannot be let properly off, and plant betwixt these. From the situation of this place, there can be nothing better than larch firs; and I beg here to suggest the planting of the whole with larch firs, to give variety to its look, especially in winter, a few Scotch and spruce firs may be put in round the borders, and all the rest larch firs; these larch firs will not only make a soil for themselves, by killing the heath and every thing else, but will grow most rapidly on this place. The larch firs should be planted at 4 feet apart, plant from plant, and these may all grow till they are fit for paling, when the one-half may be cut out, leaving them at 8 feet apart; when the trees are fit for small roofing, &c. another half or thereby may be cut out, leaving the trees now on the ground, at 16 feet apart, at which distances they may stand to be reared up to maturity as timber trees. In this case, the first thinning may commence when the trees are at a height of about 8 feet; this may be about eight or from eight to ten years after planted, at which time this plantation of larch firs will begin to pay. The second thinning should be when the trees are at a height of from 18 to 24 feet, which will be about the age of from 14 to 18 years, when the thinnings, at this time, will

pay from L.15 to L.25 per acre : as the thinnings would not sell all in one, two, or even three years, so that the second, and even first thinnings, must proceed gradually as the timber can be disposed of to advantage, and the trees will always be increasing in size and value, as the thinning goes on ; we have still upon the ground, after the second thinning, between 200 and 300 trees on each acre, which, if allowed to stand till the age of thirty years, each tree will be worth from 20s. to 30s. sterling ; but, suppose them only to be worth 20s. a tree, in such a part of the country as this they should bring much more, but I say, suppose them only at 20s. a tree ; there remains, besides what has been sold off, upwards of L.200 sterling of value of timber on every acre. Is not this a profit enough to satisfy the most avaricious mind ; and this is what experience has enabled me to say, that I will be bound, the soil and situation will produce much more than this estimate. Such results I have experienced in my own time. As one proof, I beg to call to the Most Noble Marchioness's memory, the larch firs mentioned in the Forester's Guide on the estate of Inverary ; these trees have been since sold, and far exceeded my estimate of them, and these trees grow on a far less favourable soil and situation than this of Danhail moss. This moss, I believe, is at present paying nothing to the estate ; it is surely worthy of being immediately attended to ; it is already enclosed. The price of larch fir plants is next to nothing : the whole could be planted for a sum not worth naming, and after the first three or four years, they will rush up like mushrooms, not to mention the beauty and ornament it will add to this estate. I should have mentioned,

as I went along, that, after the second thinning, the ground must be filled up anew with plants, as the larch is not like the oak to grow from cutting; and when the old trees are cut down, the ground will be full: thus, there will be always a cutting more or less, as the demand for the timber may be.

Narrow Stripe of Planting on Righill Farm. Estate of Rowallan, Ayrshire, Surveyed in April 1829.

The eyes of every human being that passes along the public road where this stripe joins, must feel hurt as if a handful of sand was cast into them, on seeing such a narrow circumscribed stripe of planting along land so much in want of clothing and shelter; as it must be plain to a demonstration, that every stripe or belt of planting put round a farm or field of cold bare land of this kind, will be so far from taking any thing off the rent of the land, by its clothing, warming and sheltering the cattle, or even crop on these fields, it will add at least 20s. an acre of rent to all such fields so sheltered by planting. The cattle thrive much better, where warm and sheltered, the pasture is more abundant and nourishing, and the crop more luxuriant. This stripe should be carried up to the next farm, and the whole should be widened at least 40 yards in all, with two or three offsets in form of a half-moon, which will add much to the shelter and cover of this place. This narrow stripe, as might well be expected, is fallen dreadfully into decay. As I am now about to enter on the planting of new ground, which is much wanted, not only on

this estate but in all this part of the country, although it is only on one or two farms that any thing like planting new ground has been looked at in this survey. Before entering on planting belts, &c. allow me to clear up a stigma or unjust aspersion, generally thrown out by the most of people against stripes and belts of planting of this and others I am about to speak of, which is as false as it is ignorantly made : that is, say they, nothing can ever be got from such plantings, that is, they are not profitable. Stripes and belts of planting may be ornamental enough to an estate, but they pay the proprietor nothing ; hence, the most of these stripes are, after being enclosed and planted, allowed to stand or fall of themselves.

It may be necessary, before advising my Lady Hastings to plant many such belts, &c. to clear up this : let it be most pointedly and particularly observed, that all such stripes, belts, and clumps, of planting that I would suggest to be made on this bare estate, is solely to serve and secure the immense and infinite advantage of clothing, shelter, and ornament, and only on such places as they would serve this important purpose, should any such be put down. Now, for an annual rental from these plantings to the estate, I shall suppose that 300 acres would not be too much detached as above, throughout Rowallan estate ; now the thinnings of these, after the first ten years will begin to pay the estate something considerable annually, but these plantings are always to be kept full of trees for the purpose they are chiefly intended. At fifteen years old, there must be 400 of the most promising and best of these trees on each acre, cleared of incumbrances in thinning, to give them room to gain the ascendancy over their neigh-

bouring trees, say the underwood. At the age of thirty years, 50 of these trees may be cut out, which will be a bad growth indeed if they are not worth 10s. each, say L.25 per acre; at the end of sixty years, other 50 trees may be cut out, which will be worth at least L.2 per tree, L.100 per acre, this is L.125 per acre for sixty years growth, and upon the same data, there is L.375 worth of large trees on each acre; here is L.2 per acre of annual rental from the time the plantations were planted, and here is the immense sum of L.375 per acre on the ground, besides all the young trees still coming up. But supposing at twenty years old, these woods are brought into a regular system of cutting, and the most profitable trees for timber being reared as the trees to be regularly cut, say the oak, ash, elm, and plane, all which, as often as cut, will grow up naturally from the stool, without any expense of planting. Now after having reduced these woods to a regular system of cutting, every twenty years there is fifteen acres to be cut annually; from these fifteen acres, there may be cut 200 trees of the 400, from every acre, and supposing 100 of these to have stood for forty years, this, as it is technically termed, one year old, and two year olds, then falls to be cut on this plan, yearly, 100 trees at twenty years old, and 100 trees at forty years old off every acre, which trees, in a manufacturing district like Rowallan, will always bring the highest price, will sell for, on an average, and at the lowest calculation L.1 per tree, which is L.200 per acre, for every fifteen acres which will cut from these stripes and belts of planting, annually, for ever. Now, here is a yearly rental from these woods, and will be to all times, of L.3000, and

that without losing them, in the smallest degree, for ornament, shelter, and clothing, as the ground, by this plan, is not only always full of young trees coming up, but also of 200 old trees on each acre, &c. also full of the underwood of Scotch and spruce fir; which, to every unprejudiced person the least degree acquainted with rearing wood, they will at once say, that I have rather under as over-rated the income; but when I say so, I speak from experience, and can place the matter beyond the possibility of a doubt.

The great utility of plantations on this bare estate, must be apparent to the most sceptical imagination, whether viewed as profit, shelter, clothing, or ornament; and when once effected, will make a perfect paradise of what was before a dreary waste, and by their benignant influence over the cold soil, will make many fields better worth L.3 or L.4 per acre, of yearly rent, than they are at present worth 10s.

Millhill Avenue, Estate of Whitehall, Berwickshire.

In attempting to replant this avenue, it appears that it has been a total failure, from what particular cause, it cannot, in looking at it in its present state, be precisely determined on. I should suppose it may be partly owing to the injudicious manner in which it had been planted, and partly owing to cattle being too early admitted into it; but be this as it may, the place, as a plantation, has been entirely neglected, and is in a most miserable state. From the situation of this place on the estate, it is of the utmost importance to have a crop of trees on it, and ought to be attended to immediately with skill and

punctuality, in the following manner ; as it is a very exposed situation, and at the same time a remarkable dry soil, the trees are killed with the blast above ground, and are starved for want of moisture and nourishment below ground, so that they must of necessity die. To remedy these two evils, in the first place, cattle, sheep, and horses must be kept out, the whole blank ground planted up with larch, and Scotch firs, alternately at three feet distant, plant from plant ; allow these to grow till they are about two feet six inches or three feet high, then cut out every second tree, leaving them at a distance of six feet tree from tree ; then plant in trees of oak, Spanish chesnut, plane and beech alternately ; these will most likely come away most rapidly being well sheltered ; but should any of them die in the top, cut them over close by the surface ; when the whole hardwood trees as above, have got two or three years growth, and are likely not to go back, the whole of the larch firs may be cut out, as it is by no means a situation for rearing larch firs to maturity, but a few of the Scotch firs may be left to be reared up as standard trees ; on the south side a triangular row of Scotch firs at twelve feet distant may be reared. Here we have a crop of the different kinds of hardwood trees as aforesaid on the ground, at six feet tree from tree, which is near triple the number to be reared up to maturity ; but here it must be carefully observed, that the whole ground must always be kept full of underwood ; this will be the very life of the trees to be reared up to maturity, as it is plain to a demonstration, that the want of it has been the death of the old trees now on it, they having all died in the top through starvation and want of sap, moisture, and

nourishment in the roots ; all which a crop of under-wood supplies by keeping the trees warm, and preserving the moisture amongst and about their roots. The hardwood trees then at six feet high, must be thinned out, by cutting those over for the growth that are to be taken out, leaving the standards, at twelve feet, tree from tree ; and when the trees shall have arrived at a height of 15 or 16 feet, thin out the standing trees to stand at distances of twenty-four feet, tree from tree, at which they may stand as a finished plantation ; being much exposed, it will admit of no greater distance betwixt the trees ; and from the hardwood trees now cut out, there will be always an abundant supply of underwood, from which a standing tree, at all times can be reared up when necessary, and it will also afford excellent shelter for game, and always maintain a respectable plantation on this place, both for ornament and profit, and at little expense. The trees of oaks, &c. to be cut out here, must be carefully dressed up for the growth ; also, a few of the hardwood plants lately put in, while they have sap in the roots, should be cut over and reared up. If the aforesaid plan is attended to, there is not the least doubt of rearing a permanent plantation here, and, I am bold to aver, as good as any on a much more favourable place of the estate ; nothing, however, but a strict and careful attention to the system laid down, and to be followed up, will preserve it on this exposed and dry situation. From this it will be perceived, that a very dry situation is most unfavourable to the growth of trees, as they require a great deal of moisture ; yet it is wonderful to see in many places trees growing almost out of the

solid rock, still the roots of such trees generally seek down to where there is moisture. There are many instances of this on the estate of Dunglass, the property of Sir James Hall, Bart. Large trees are to be seen in the glen at Dunglass growing out of the solid rock, many of which are very great curiosities; they have strong roots, some of them upwards of twelve inches projecting from and running down the face of the rock for ten or twelve feet to where they receive the moisture, the base of the rock being marshy and wet, and some of them washed with a running stream of water, &c.

**A METHOD ON EQUITABLE PRINCIPLES FOR VALUING
WOODS, PLANTATIONS, AND TIMBER-TREES OF ALL
AGES, AS INSEPARABLY ATTACHED TO AND TO BE
SOLD WITH THE LANDS ON WHICH THEY GROW.**

That woods, plantations, and timber trees, hold a most distinguished place on every estate in the opinion of every one, but especially of a proprietor, none will deny, whether we view them, for ornament, screen, shelter, or profit. These are in an especial, and infinite degree interesting, where the estate is the residence of nobility and rank, and inexpressibly so, when occupying the pleasure grounds around a mansion, lawn, park, or grove; so that trees grown up to half maturity, and healthy and thriving on the pleasure grounds, as they are yearly increasing in beauty, size, and value, are certainly (and will be considered so by every lover of trees) worth double their intrinsic value, as timber, when to be sold to the tradesman. The value of all such plantations and trees will be infinitely appreciated, when we consider them in their true light, as the only permanent beauties that can adorn the face of nature. Being myself a great lover of trees, my zeal may lead me to value those occupying a pre-eminent station around the mansion of a proprietor, whose stately, gigantic, and pyramidal tops are seen from the windows, towering to the clouds in magnificent grandeur, much higher than the most splendid unnecessary furniture of the drawing room. Being once in the drawing room of the palace of a noble Duke, in company with a noble Lord, while waiting on his Grace, his Lord-

ship was pointing out to me the beauties of the room, (which was very splendid,) and adding the immense sum it cost, and the time occupied by the artist in adorning it; his Lordship seeing me looking out at the window, said, I suppose, Monteath, these have no great charms for you, you would rather see a good tree; which brought a reply, Oh! my Lord, yonder is a Spanish chesnut and some lime trees, which no doubt are some of nature's favourite children, which the revolution of centuries has only brought to their present degree of perfection, without any expense to the Duke, either of five thousand pounds, or one pound. The third part of their years will tarnish many parts of the beauties of this room, whilst, with these venerable trees, the more years the more beautiful, and when drest in their summer robes, I say verily, not this princely room only, but Solomon in all his glory was not arrayed like one of these.

In my Forester's Guide, first and second edition, I have given a method of valuing woods, both natural and planted, and timber trees of all sizes, which I have the satisfaction and authority of saying has been generally useful to the Proprietor, Forester, and Merchant, for whom such a system of valuing was intended. The difference of opinion among those who are generally employed to value woods, &c. for the sale of the estates or lands on which they grow, is very great. A great many of the persons employed to value woods are such as make merchandise of that article, say wood merchants, these gentlemen, generally speaking, are very good judges of the value of timber when it comes to the timber-yard, and particularly those who are in the practice of buying and manufacturing growing wood and trees, still the greater part of these valuers proceed upon the supposition

of these woods and trees being all cut down at the time they are valued, and only value these woods and trees at what they would bring were they presently to be cut down and lying in the timber-yard. Hence many of these valutors do not put as much value on young, new made, or even plantations from one to ten years old, as would pay the expense of planting them. Many of such valutors consider that unless the trees in all plantations are arrived at a size fit for some saleable purpose as timber, they are of little or no value. I have known many valutors who were excellent judges of growing woods and timber trees, arrived at a size when their timber was convertible into saleable purposes, put little or no value on young plantations, nay, not so much as would pay the expense of planting. Some valutors too, have even gone the length of saying, that woods and plantations growing on the lands of an estate for sale, as they are but a part of the estate, there should be no value put on them at all, but just go with the lands. Another class of valutors there are, who take a sort of general account of the gross number of the trees on an estate, and they say they are worth a penny each, a sixpence, or a shilling each, &c. Hence, we find, that not many years back, many estates passed into new proprietors hands for little more money than the value of the growing wood upon them. Such was the case of Callendar estate, near Falkirk, Stirlingshire, Tulliallen, Perthshire, and many others. The principles on which I proceed in valuing growing woods, plantations, and timber trees* for the sale of estates, and insepa-

* By woods is meant here, natural grown coppice, by plantations, young plantings, by timber trees, such as are measurable timber, and full grown trees.

rably attached to, and to be sold with the lands on which they grow, and which I would reckon on equitable principles, are as follows.

1st, Take every park, field, den, valley, hill, or farm, on which there may be woods, plantations, or single timber trees, stating each place distinctly by its proper name, known on the estate, or which is in the plan, accurately noting down each in a book.

2d, *Natural Woods or Coppices*.—Take the number of acres, the average number of stools or growths on each acre; if there is a difference of the ages, take each by itself, taking the crop in the way and manner as is particularly described in the Forester's Guide, for valuing natural coppice woods; by this means the value of the crop, as it is at the time and age the valuation takes place, stands on the ground, may be accurately ascertained; but something more is necessary to be added to the value of the crop at present on the ground; for instance, an acre of natural wood, will, when completely full, carry 800 stools or roots, and each of these stools will produce, on an average, three stems, (see this fully explained in Forester's Guide) each of these stools is worth three plants, even the very year they are cut over, as they grow three times faster than from the plant, and are in no risk of failure, and requiring to be filled up from time to time, as plants are, so that one acre of natural cut wood, although newly cut over, is worth, and of more value than three acres of new made planting, admitting that both wood and planting is enclosed. Now granting that the produce of each acre of natural oak coppice at twenty years, wood and bark is worth L.150, and this will be found to be the case where the ground is full with 800 stools each acre

and where the expense of inland carriage is not above fifteen shillings per ton of bark—See Forester's Guide, ten per cent. say L.15 each acre, may reasonably and equitably be added, between seller and buyer, as it is an improvement already made and finished on the estate, that will continue to all time, without one farthing of expense, of replanting, or keeping up, or risk of failure, &c. Also, supposing, and even admitting that the coppice or natural woods has been newly or lately cut over, if the ground is full, as aforesaid, with 800 stools, average on each acre, it should be valued, and is well worth to the purchaser of the lands, and will be a fair and equitable value, between seller and buyer, at fifteen pounds per acre. Should the ground not be full with the number of stools on the acre, as aforesaid, an average deduction must be made, according to the number of stools deficient.

The valutors must observe, that I am taking here the most productive coppice, or natural woodlands; still it must, and will be admitted, that I am L.30 per acre under the produce of some natural oak woods known in Scotland. See Forester's Guide. Of this, however, all valutors, who are acquainted, and in the practice of valuing these woods, will easily judge, so that when the produce of a full crop is less, of course, the per centage and value will be less also, as natural oak woods, owing to soil and climate, are not all equally productive.

Plantations. Many valutors, (especially those dealers in timber already noticed,) pass over young plantations altogether, without putting almost any value on them. This, however, is by no means fair or equitable, as no sooner is a plantation enclosed

and planted than it is most certainly worth the expense laid out in enclosing and planting ; but I say, that if the situation of a plantation is well chosen and enclosed, and the plantation judiciously done, with proper plants to suit situation and soil, it is worth more, and should be valued at more to the incoming proprietor than the bare expense of planting and enclosing, &c. Besides, the purpose such a plantation is designed to serve on an estate should be taken into consideration, such, for instance, as if it is to beautify the estate, if it is to shelter some exposed fields, or if to cover from the view some very unsightly place, or even granting it is only for profit alone ; in all of these cases, I say, (but some men say no,) it is worth more than the mere value of enclosing and planting, as it comes into the hands of a new proprietor as an invaluable improvement (in many instances) already made on the estate. This I aver, granting that the plantation is made solely as to be cut for profit alone, it is so soon as made worth at least five per cent. on the outlay of expense of planting and enclosing, and as the plantation increases in years before the sale of the estate, and before the trees come to be valuable as timber, an increasing price, according to the health and prosperity of the plantation, should be added annually, and this more or less, according to the important purpose the plantation is to serve on the estate, and as the trees increase in life and vigour in their growth. Before the plantation comes to be valuable as timber, which will be when about the age of 15 years, the following table will be an equitable valuation, always adding the rental of the land, say what it would have been worth before being planted, &c. If the plantation is full of trees properly selected to suit

situation and soil, and all healthy, they will be past all risk of failure at seven years old, and may be valued by that time at ten per cent. as under, taking always whatever the cost price may have been.

Years Old.	At L. 3 per Acre if on cost. At 5 per cent.			At L. 4 per Acre if on cost. At 5 per cent.			At L. 5 per Acre if on cost. At 5 per cent.			At L. 6 per Acre if on cost. At 5 per cent.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1	3	0	0	4	0	0	5	0	0	6	0	0
2	3	3	0	4	4	0	5	5	0	6	6	0
3	3	6	1 $\frac{1}{4}$	4	8	4 $\frac{1}{2}$	5	10	3	6	12	3 $\frac{1}{2}$
4	3	9	4 $\frac{1}{2}$	4	12	9 $\frac{3}{4}$	5	15	9	6	18	11
5	3	12	10 $\frac{1}{4}$	4	17	5 $\frac{1}{2}$	6	1	6 $\frac{1}{2}$	7	5	11
6	3	16	5 $\frac{3}{4}$	5	2	4	6	7	7 $\frac{1}{2}$	7	13	3
7	4	0	3 $\frac{3}{4}$	5	7	5 $\frac{1}{2}$	6	14	0	8	0	11
	At 10 per cent.			At 10 per cent.			At 10 per cent.			At 10 per cent.		
8	4	12	9 $\frac{1}{2}$	6	4	1 $\frac{1}{4}$	7	14	9 $\frac{1}{4}$	9	5	10 $\frac{3}{4}$
9	5	2	0 $\frac{1}{2}$	6	16	6	8	10	3	10	4	5 $\frac{1}{2}$
10	5	12	3	7	10	1 $\frac{3}{4}$	9	7	3 $\frac{1}{2}$	11	4	11
11	6	3	5 $\frac{1}{2}$	8	5	1 $\frac{1}{4}$	10	6	0	12	7	5
12	6	15	9 $\frac{1}{2}$	9	2	8	11	6	7	13	12	1 $\frac{3}{4}$
13	7	9	4 $\frac{1}{2}$	10	0	11	12	9	2 $\frac{3}{4}$	14	19	4 $\frac{1}{4}$
14	8	4	3 $\frac{1}{2}$	11	1	0	13	14	2	16	9	3 $\frac{1}{2}$
15	9	0	8 $\frac{3}{4}$	12	3	1	15	1	7	18	2	2 $\frac{1}{2}$

After the plantations are 15 years of age as above, the crop may be valued as timber trees, as they will be fit for some purpose or another at this age, and may be valued on the following principle as timber trees.

Timber trees. This includes all measurable timber trees, and for the sake of making it plain and easily understood, I shall here strike the measurement of the first description of trees at an average of five feet only. Now, if the following method is accurately attended to, and the valuers the least acquainted with the prices of timber, and the method

of accurately measuring growing trees, it will be found a most equitable and sure valuation.

Count the exact number of trees in every distinct wood, plantation, park, field, or farm, each by itself, that will average five feet a tree, taking every kind distinctly by themselves, and take the value of each kind per foot at the fair market price, say at what each kind would sell for delivered at the nearest place of sale, after paying expense of carriage, &c. say oak, ash, elm, and every other kind ; thus having ascertained the number of every kind of tree in the different plantations at five feet average measure, put down the selling price, and this gives you their intrinsic value as they now stand. Now, supposing this to be a plantation of trees to be cut down for sale, this valuation is correct and just, but if such a plantation of trees are for ornament, screen, shelter, &c. &c. to be reared up to maturity as such, and the whole in a healthy and thriving state, and yearly increasing in size and value, as they naturally will do, making annually from one to two feet of timber, and supposing them to be oak and elm, or such like trees, which will stand a value of 2s. per foot, making 10s. per tree, their improving price as young healthy thriving trees, past all risk of failure as a plantation, should, nor can it be less than ten per cent., as the very first year's growth will make them much more valuable, and every year they will be increasing in magnitude and value, not equal only, but in a degree much more than ten per cent.

The next average of trees should be all those in the plantation at ten feet. Now my reason for not reducing the whole to one average is, what every one the least acquainted with the value of timber knows,

that a tree or trees with ten or fifteen solid feet of timber, is worth sixpence more per foot generally than those at five feet, as they will answer more particular purposes as timber, and as it is most generally and well known that young healthy thriving trees at from three to twenty feet of timber, will grow faster and increase more in size in proportion annually, than trees above those sizes, or those having arrived at or near their maturity will do, the improving and increasing price should be, and I would fix it at more than trees arrived at or near their maturity or full growth; therefore the additional or improving price for the trees at this, say an average of ten feet, should also be ten per cent. added to their intrinsic value as timber.

The next average of the trees in every distinct plantation or place should be taken at twenty feet. In these sizes of trees the increase in growth is more slow, therefore the improving price should only be in addition to their intrinsic value as timber, seven and a half per cent.

The next average of trees in every plantation or place should be all those at forty feet; and here in trees of this size the growth is much more slow, the improving price should be only two and a half per cent.

The next description of trees will be all the old full-grown trees, and as these may be said to be rather fallen off as increasing in value, their intrinsic value as timber will be a fair one between parties, yet many of these trees, from the conspicuous situation they may hold on the estate as beautifying it, may be reckoned worth more than double their intrinsic value as timber, so much so, that many pro-

prietors would not dispose of an old tree or trees about their pleasure grounds, &c. not for any money. All such trees should be considered as amongst the natural, and, I may add, the first natural beauties on the estate, and valued with the property as an invaluable embellishment.

Thus having classed or arranged the woods, plantations, and timber trees in the preceding order, to those in the least accustomed or acquainted with the valuing of growing woods or timber trees, &c. it will be found easy, and they may proceed with accuracy and equality between man and man. To new beginners in the art of valuing growing woods and trees of all sorts, I would advise them to consult my Forester's Guide, where they will see the method for valuing all kinds of growing woods, plantations, and timber trees clearly elucidated. Proceeding on the principles here and in the Forester's Guide laid down, the task will be both easy and true, and will at the same time be of great use and advantage to the new proprietor of an estate, as by this means he is at once made acquainted with the value of his woods, &c. as they at present stand, and can accurately ascertain their increasing value yearly afterwards. And should the person valuing be a judge of the methods of rearing up and improving woods, plantations, and timber trees, and accompanying the valuation of each plantation, place or farm, with a correct report of their state and means of improving all such, either to serve for profit, ornament, or otherways, on the estate, it will be found, if judiciously done, of most essential benefit to the proprietor in future. It is foolish in the extreme for proprietors, whether as sellers or buyers of estates, to employ persons not proper judges

of these matters as valuers, as both may be losers thereby. On the valuation of the woods, plantations, and timber trees on sundry estates of late, and which I could mention by name, the greatest difference betwixt valuers, as to the valuation, has taken place; in one case no less than about L.12,000 sterling. The one valuer, who shall be nameless, proceeded on the principles as herein laid down, and the other as a valuer of timber only, the one was about L.20,000, and the other only about L.8000. The difference arose from the following; there were on the estate about 200 acres of oak coppice, well enclosed, and pretty well filled up with oak about seven years growth; all this, except a few old reserve or maiden trees, went for nothing with the timber valuer. There were also upwards of 100 acres of young plantations, all well enclosed and thriving, from three years old to thirty, all full and well kept; those of the plantations from three years old up to fifteen years, were not by the timber valuer valued at as much as would pay the plants and expense of planting, notwithstanding all of them were most substantially and permanently enclosed with stone fences, and the situations well selected as an improvement on the estate; also those of them from fifteen to thirty years old were only valued by him as fit for stobs, and insignificant stuff, although the trees in many of these plantations, being chiefly larch firs, will average three feet of solid timber; herein lay the greater part of the difference. Although the estate was intended to be taken at a valuation, I need hardly add, that even the lowest valuation did not give satisfaction, nor please either of the parties.

How foolish and how false in the extreme it is for

a person to value the timber of a tree for the sale of an estate, when it is to be reared up to maturity and to stand as ornament, and yearly increasing in size both in trunk and top, in the same manner as he does it when to be cut down for sale as timber. We shall suppose a tree with ten feet of solid measurable timber in its trunk, the said tree having a most beautiful spreading top, (and growing in the pleasure grounds and inseparably attached to the lands,) but none of the branches of the top are measurable timber, and when the tree is valued for sale, nothing is counted on the tops, taking the trunk or measurable timber part of the tree as aforesaid, at ten feet, at two shillings per foot, is one pound, this is all it is worth if cut down as timber, and all it will sell for, the branches or tops, as is customary, being allowed the purchaser for his expense of cutting down and removing, &c. goes to him for nothing. Now, supposing an estate to be sold at a valuation, and the trees valued in this way, it is but evenhanded justice, says a selling proprietor, I cut all the tops off the trees and leave you only what is valued, and what you are to pay me for ; you can ask no more. Only think how an incoming tenant would stand appalled to have the tops of the trees about his pleasure grounds, (their only beauty,) all loped off. No, no, he would at once say, I will most cheerfully pay as much for the top of yonder tree as its trunk, it is such a perfect beauty. The tops of trees occupy more ground than their trunk, and to preserve good, proper, and ornamental tops, which is the tree's only beauty, cost the proprietor much more expense in rearing than its trunk did. In all cases, the tops of trees about the mansion of a proprietor, and in the pleasure grounds,

may be said to be worth as much, that is, as valuable as their trunks or measurable part as timber, without even taking into view their increasing value as a thriving healthy growing tree.

Were I asked the difference betwixt the value of a block or log of timber, (say the ten feet tree just mentioned,) when lying in a timber yard, and the value of it when growing as aforesaid in some conspicuous place, and rearing its magnificent and mighty head, towering to the clouds like a gigantic and imperishable pyramid, to propagate and diffuse its fragrant beauties to generations yet unborn, I confess I could not tell, the more I think of the vast difference, the more I am nonplused to say what it really should be.

Taking this view of the matter, and which will, with every lover of trees have its due weight, in ten cases out of twelve the tops of all such ornamental trees will be, and may justly be considered worth as much as their trunk or measurable part, as for instance the tree of ten feet just mentioned ; but I do not mean to be understood to say that all ornamental trees should be valued as such, say double, but I say that the increasing price of all healthy thriving ornamental trees, when valued for the sale of the estates upon the principles as herein laid down, I am fully of opinion, will be considered as a just and equitable one betwixt buyer and seller, and when properly and impartially attended to, will be satisfactory to all concerned. We may even suppose a case, that the trees are only to be valued as timber cut down, and what they would sell for as such, and nothing but their measurable timber to be taken into the account of value. Even taking this view of the matter, the very tops of all such trees, or more properly speak-

ing, the unmeasurable timber, which will include more than the mere crops, is worth something not altogether inconsiderable both as stabs for fences or fuel for burning. That of putting an increasing value on young healthy thriving trees may be illustrated by the buying of a young horse, for instance; a horse at one or two years old is worth nothing for immediate use or work, but in other two or three years the horse, if he lives and continues to thrive, he is now fit for work, and is at once worth double or three times the price paid for him when young. Now, young trees are not like a young horse, they take no expense in rearing, and even granting the plantations are only for profit, whenever they come to maturity as timber trees, each tree is worth a large sum. This is particularly the case with the natural oak coppice woods, although these are newly cut over, and worth nothing (in the eyes of some valuers,) still these grow up without any trouble or expense, and a crop is got from their roots in twenty years of L.150 per acre, or in some cases of L.200, equal to L.7, 10s. of yearly rent.

**A HINT TO LANDSURVEYORS, AND NOT UNUSEFUL TO
LANDOWNERS.**

Before finishing this miscellaneous manual, permit me, with profound respect, to give a hint to that intelligent and respectable body of professional men, landsurveyors, which I hope will be both useful and interesting to landed proprietors. In another part of this work, see page 44, it will be seen that I have recommended the propriety and advantage of all landed proprietors having their lands, &c. surveyed by a

proper professional person, and a scheme of improvement and reclaiming of the waste lands on the estate, &c. laid down. I beg leave here to give my decided disapprobation against a practice that prevails in Scotland, although not known in England or Ireland, that is, of employing schoolmasters to measure lands, it is by no means out of any disrespect to these ill-requited body of men, who are the means of riveting the principles on the human heart, that are afterwards to govern both church and state, and who deserve better of their country ; I know well many of these gentlemen can well and accurately measure lands, and make a good plan or map, but are no more judges of soils, or improving waste lands by draining, planting, or reclaiming in any respect, than a cow does about a new-coined shilling, and, of course, are very unfit judges of such necessary improvements, whereas a professional landsurveyor is most generally less or more a judge of soils, and what may or may not be improvable ; when lands are measured, and a map given, the number of acres in each field, as also of arable and unarable lands are distinctly marked on the plan ; but I have never yet seen a plan or map of an estate, (nor is it indeed ever done) where there is a description of the different fields or waste lands given as to their state and cultivation. Now, what would be of the greatest utility and advantage to proprietors, when the surveyor is on and going over the ground, if he were to accompany his plan or map with a report and description of every field, but particularly the waste lands, and different woods and plantations, with the kinds, stating distinctly and accurately, so far as their judgment goes, what part of these wastes or lands are improveable, and to what purpose they can be most profitably converted, and by what

means,—with the probable expense. When the surveyor is going over the lands, he can take his notes of all such, so that he can bring them briefly into such a state attached to the maps or plans, as will be of great use and highly satisfactory to the proprietor, at little expense, and which will afterwards save him considerable outlay.

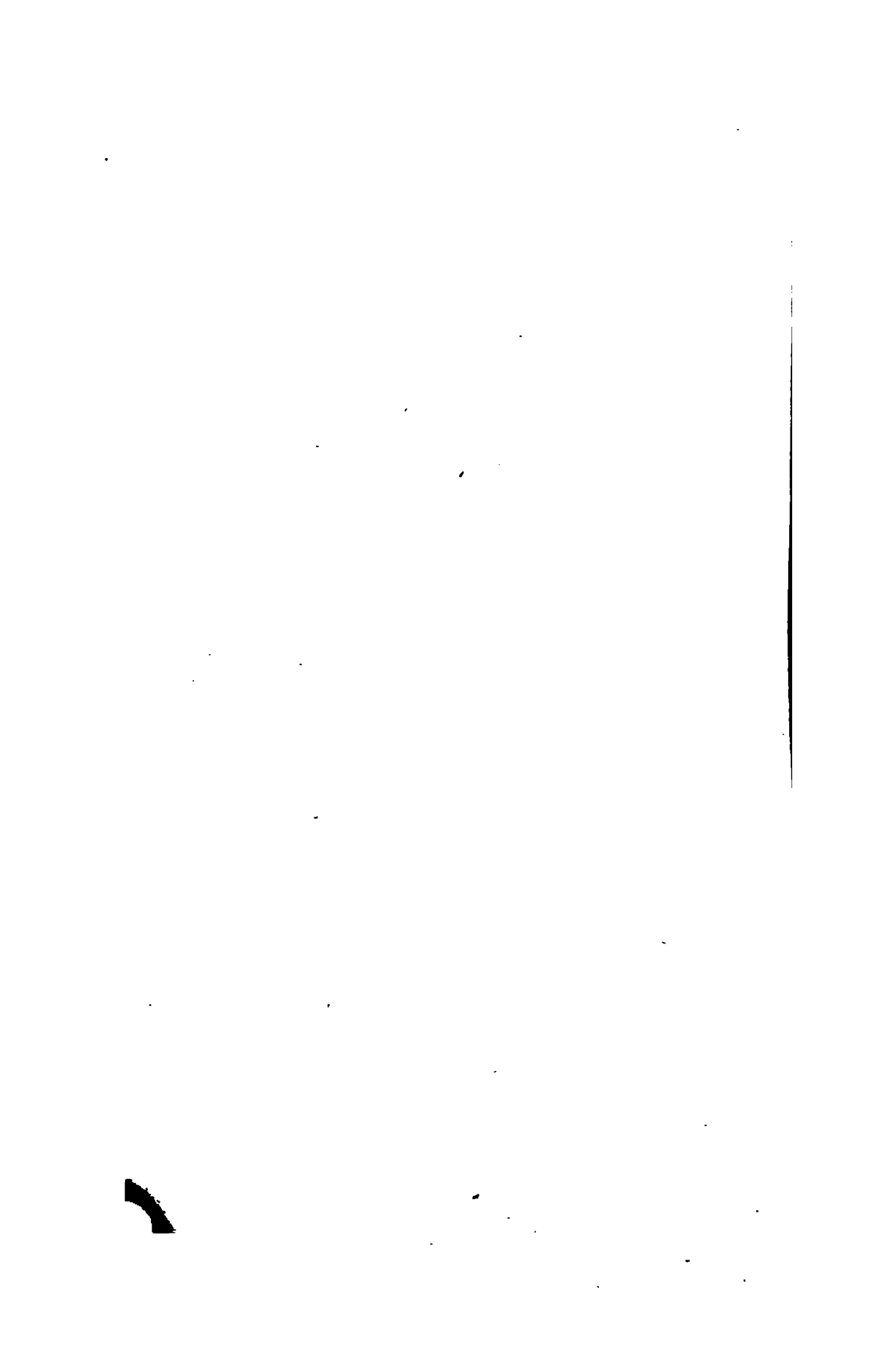
A proprietor having a plan or map of his estates furnished with these remarks, when judicially made, although he is a thousand miles distant from his property, can give directions and instructions for cultivating and improving, by planting, draining, &c. &c. &c. this, that or the other part, portion, or so many acres of any part of his waste lands he may from time to time think proper and advisable, and knows something of the probable expense and the returns he is likely to have from all such. This is a matter of very great importance, and I hope will become general in future. I have often had to regret, and many a time complained of the want of such a report when called upon to value the woods, plantations, and timber trees on the lands of an estate, particularly when the property was for sale, and when the proprietor put into my hand the plan, he supposing it would be of the greatest use to me, whereas it was, for want of this very thing, as before stated, for no more use to me, nor any other man, for such a valuation, than an Aberdeen or Balfast old almanack.

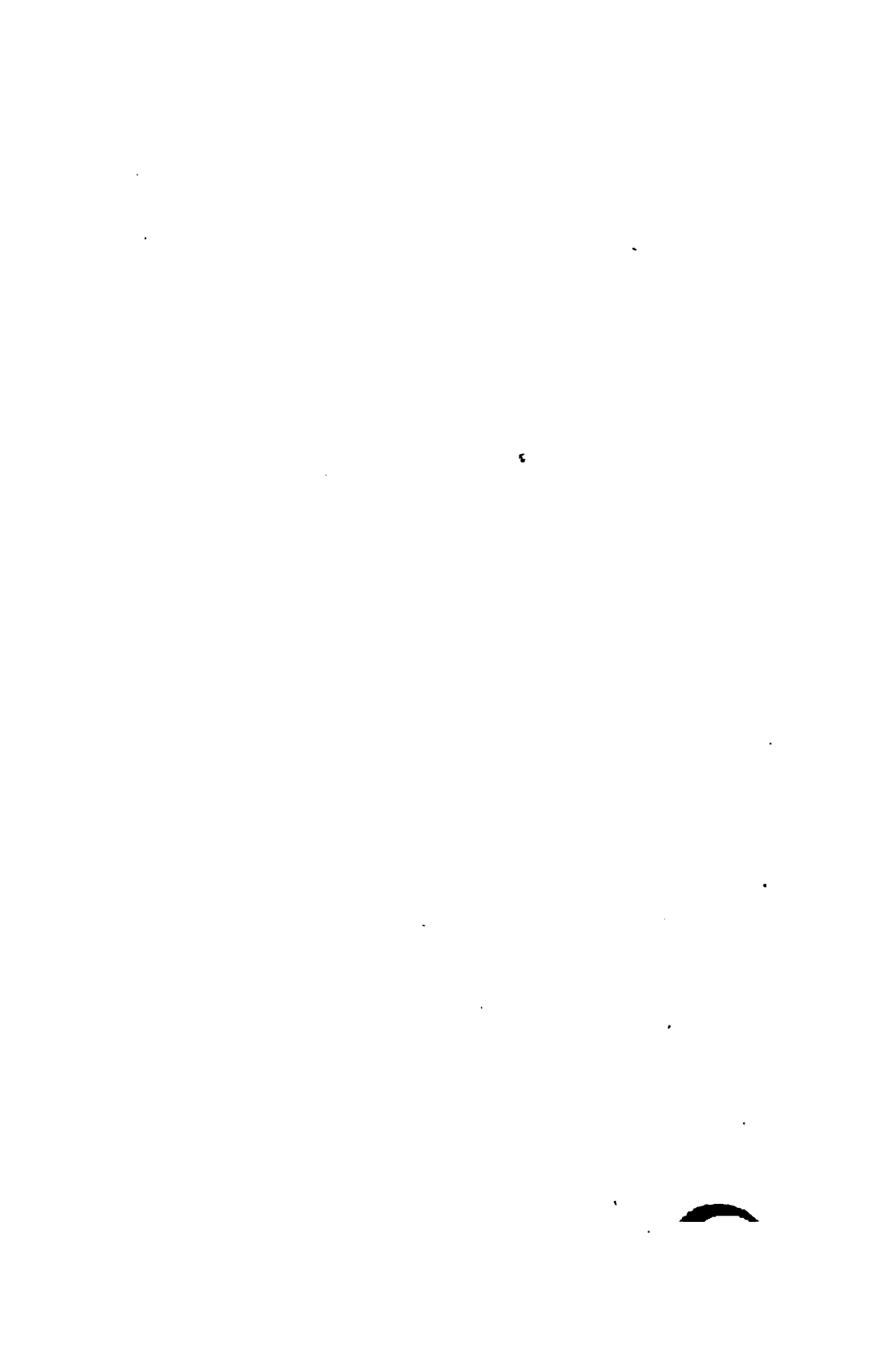
FINIS.

ADVERTISEMENT.



THE Author directs the business of Planting of every description, whether for ornament or profit ; instructs as to the particular plants most suitable to situation and soil ; directs their thinning and rearing to maturity ; gives a proper system for the recovery of neglected Plantations, and plans for their future improvement ; values Woods and Timber Trees of all ages, whether these are for cutting down or to be sold with the Property ; directs as to the most advantageous methods of sale, and will undertake the superintendence of the above objects either by periodical or occasional visits.—Letters addressed to Robert Monteath, Forester, Edinburgh, will be forwarded and attended to.





1

—

